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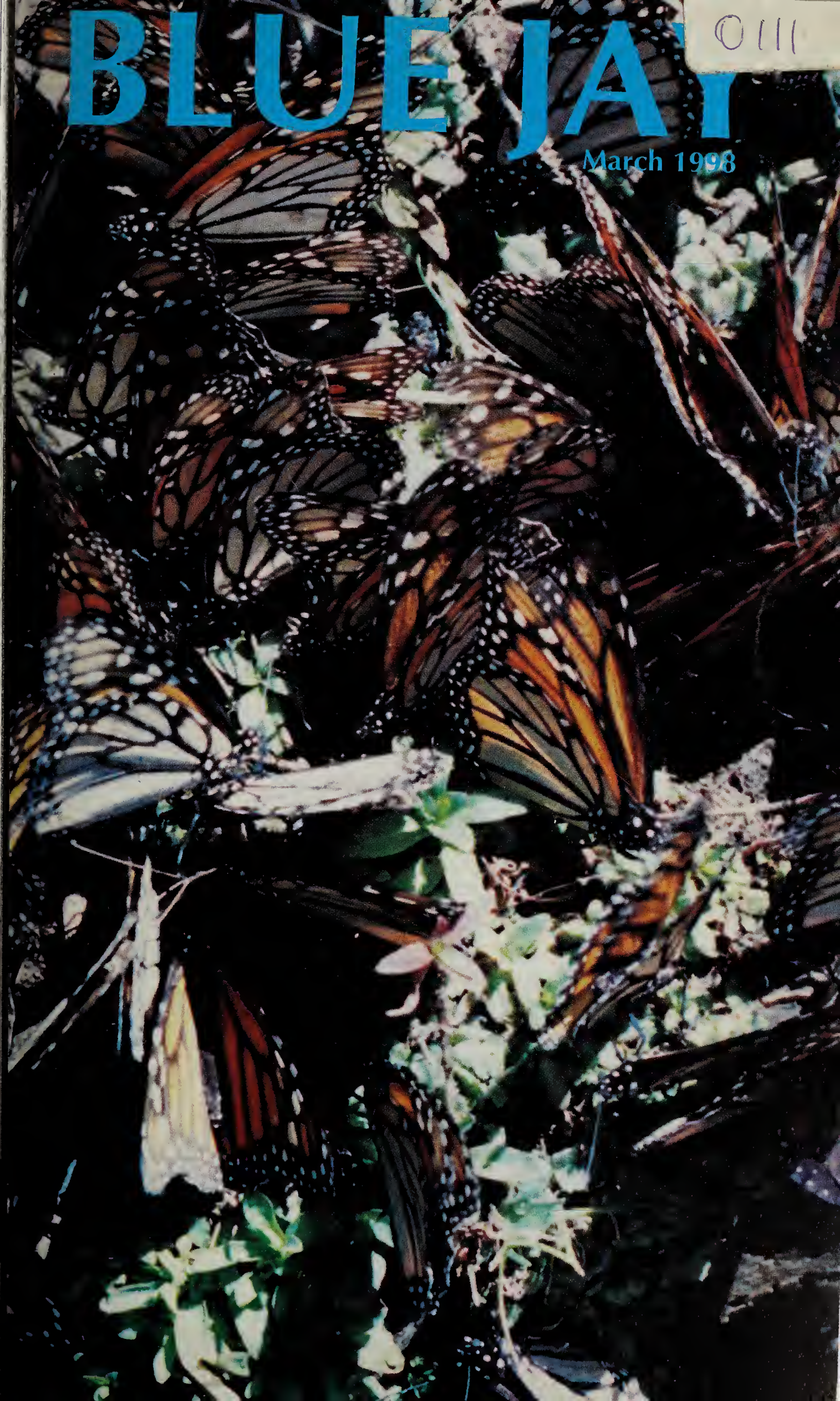
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# BLUE JAY

0111

March 1998





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**Cover:** Wintering Monarch Butterflies at the Rosario Monarch Butterfly Reserve Michoacan State, Mexico, by David Gauthier.

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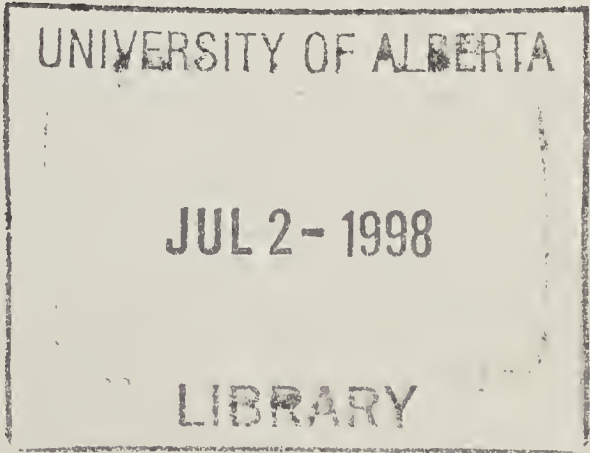
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# EDITOR'S MESSAGE

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By the time you get this issue it will be Spring!

The editor's job continues to have its ups and downs. The December issue went to print on 19 December 1997, yet my copy arrived at my home on 3 February 1998 (by then we were well into organizing this issue!). On the up side, the New Year has brought some pleasant surprises. I have been very pleased to get several interesting articles at the beginning of the year. Please keep them coming. Continuing on the upside I received Dan Brunton's article on Salamanders and re-established contact with this old friend. In searching for some information in past issues I discovered Dan had been a contributor to *Blue Jay* for many years. Bernie Gollop, besides being a past editor, has also been a stalwart contributor (as well as an occasional critic to keep us on our toes!). Keep it up Bernie.

When my December issue arrived I realized that the fawn in Ron Jensen's photograph was hidden by the mailing label. If you have not been able to find the second, "hidden," deer look under the label.

I was very disturbed to get a report of the status of British breeding birds. The most astonishing part is that Starlings, a bird that was so abundant it was regarded as a pest by all but the most avid bird lover, has slumped by 45%. The numbers of other birds that were also very common when I started birding in my youth have fallen too. For example, the Tree Sparrow, is down by 95%, the Skylark by 62%, the Reed Bunting by 60% and the Song Thrush by 56%. These were all birds that I regarded as a normal part of my daily life. Many other familiar birds such as Blackbird, Yellowhammer, Pied Wagtail and Greenfinch have all declined by 25% to 50%. What is equally disappointing is that since I left Britain the RSPB (Royal Society for Protection of Birds) has made major strides in protecting habitat and developing both legislation and public attitude for the betterment of wildlife. Recently, the RSPB reached a million members, a symbol of public concern and care. Yet sadly they are seeing similar declines as we are with our prairie birds. The alarm bells are ringing; will the politicians and community leaders take note?

The ever vigilant Stuart Houston discovered that I had omitted the price (\$12.00) of *Birds of Besnard Lake* in *Blue Jay* 54(4): 226-27, in the review by Tony Diamond. I am still waiting for someone to spot the fish dish error! You will know it when you see it. The *Blue Jay* is proof read at least five times before it is printed. The fourth review was done by Agnes Bray of Canadian Plains Research Center. Despite our best efforts Agnes could always find a number of obscure errors. She recently took her much-deserved retirement so will be greatly missed. Please join me in wishing her well and extending our sincere thanks for her important contribution to our journal.

Sincerely,

Roy D. John



# BIRDS

## 56th ANNUAL SASKATCHEWAN CHRISTMAS BIRD COUNT - 1997

Compiled by WAYNE C. HARRIS Saskatchewan Environment and Resource Management, 350 Cheadle Street West, Swift Current, Saskatchewan. S9H 4G3

The effects of *El Niño* were a pleasant change after the winter of 1996-97. The fall leading up to the Christmas count period (December 19 - January 4) was unseasonably mild and dry. There was virtually no snow cover throughout the south until just before the New Year and above freezing temperatures during the day were the norm. Water remained open on a number of larger lakes as well as many streams and rivers.

The average overnight low for the entire period was only  $-10^{\circ}\text{C}$ , the average daytime high  $-4^{\circ}\text{C}$  (Table 1). If not for the 15 counts carried out after the colder weather arrived on January 1 those averages would have been much higher. The coldest temperatures were reported from Kamsack and Pike Lake with  $-35$  while Eastend - Consul had the warmest at  $+12$ . Overall we went from one of the coldest counts in 1996 to one of the warmest in 1997; will 1998 be average?

A record 103 counts were completed this year, four more than the previous high of 99 in 1991. The total number of participants increased from 666 last year to 857 in 1997, and was 120 more than the former high in 1994. All of this combined to better coverage overall than in any other year. (Table 2).

### The Birds

One hundred and twenty-one species were recorded during the count period, 116 of these on count day with five more seen during the count period but not on count day. In addition to these there were three recognizable subspecies

and one colour morph (Table 3, 4 and 5). This far exceeds the 100 species recorded during both 1988 and 1996 counts. Fort Walsh topped the number of species recorded on count day with 43 while Saskatoon's 41 with 4 additional count period species was the best overall. There were four counts which had 40 or more species and seven that had 30 or more.

With a record number of species it is not surprising that the total number of individuals seen is also up. A total of 158,298 individuals were tallied, more than double last year's total and exceeding the previous best year by more than 45,000. The front runners in most abundant bird category were Canada Goose and Mallard. The 56,832 Canada Geese still in Saskatchewan was almost double the overall number of Canada Geese found in all previous 55 years combined. In fact the 27,800 Canada Geese at Estevan almost equalled the 55 year total! Snow Bunting were surprisingly low on the list ranking 7<sup>th</sup> in abundance compared to normally 1<sup>st</sup> or 2<sup>nd</sup>.

### New Species

Three new species were recorded this year bringing the all time list to 167; one on count day and two as count period species. The new count day species was a Western Screech-Owl from Leader South. This bird was found by Brenda and John Flood in a stand of cottonwoods along the South Saskatchewan River. It was very tame and allowed the observers to approach quite close before flushing. Brenda and



John watched the grey phase owl for more than 15 minutes in excellent light. There is one other possible record of a Western Screech-Owl from the Fort Walsh count in 1984 but this bird was seen in poor light conditions and was thus left as an unidentified Screech-Owl. Western Screech-Owls have also been heard calling in the spring in the Cypress Hills and considering that they nest in the mountains to the west, one could easily follow the Saskatchewan River system to Leader.

The count period species were Hermit Thrush and Orange-crowned Warbler. The Hermit Thrush was found at MacDowall by Myron and Hazel Barton and had been seen several times during the fall but disappeared on December 14. After being absent for more than two weeks it reappeared January 2 with the onset of colder weather and general snow cover. It was feeding on raisins at the feeder and also on elderberries on a nearby shrub. Hermit Thrushes normally winter no farther north than the southern United States except in coastal areas where they are north to British Columbia in winter.

The Orange-crowned Warbler was found in Saskatoon by Ed Driver. The individual was seen on average every 5<sup>th</sup> day from late fall through to December 31; it was not seen after the onset of cold weather. This individual was usually accompanied by 4 chickadees and 2 nuthatches and preferred to feed in an apple tree. It ate at the apples from near the stem end and also foraged along the branches. Winter distribution of Orange-crowned Warblers is similar to that of the Hermit Thrush, being found in the southern United States and north along the Pacific coast to southern British Columbia; it and the Yellow-rumped are our most hardy warbler species.

## Other Rarities

Table 4 lists the least frequent species on the counts and the rarest species are all in this table. A Lincoln's Sparrow at Raymore was only the fourth record; three of them in the last three years. Savannah Sparrows had only been seen once before but this year were found at both Gardiner Dam and Rockglen - Borderland. For only the second time Ring-necked Duck (Saskatoon), Greater Scaup (Gardiner Dam) and Oldsquaw (Saskatoon) were reported. Single Yellow-rumped Warblers were found at Biggar and Regina providing the 3<sup>rd</sup> and 4<sup>th</sup> records.

## Population Trends

Table 7 compares populations of some of the most frequently recorded species. Not surprising given the mild conditions was the tremendous jump in waterfowl numbers. Raptor numbers were relatively stable. With the exception of Ruffed Grouse, grouse numbers were down although the magnitude of grouse declines may have been amplified by the lack of snow which made these species harder to find. Although Evening Grosbeaks were more common than normal, the remainder of the winter finches were much below the normal. Both Snow Bunting and Horned Lark were very scarce but like the grouse the very open conditions may have made them harder to find.

## Count Areas and Participants

(Names of compilers are in italics.)

1. ANGLIN LAKE. Don Buckle, Marshall Gilliland, *Mary Gilliland*, Debbie Greening, Bessie May Mucho, Suzanne North.
2. ARCHERWILL. Faye Black, *Ken Folstad*, Pauline Hnetka, Annette Kozak, Judy Revoy, Doris Slind.



- 3.ARMIT. Enid Cumming, Anne Harris, Valeri Harris, *Wayne Harris*, Sheila Lamont, Susan McAdam, Steve Van Wilgenberg.
- 4.ASSINIBOIA. Ed Bearss, Jack Burgeson, *Cecil Hayward*, Dave Landa, Delmar Pettem, Wilf Prentice, Ken Schuweiler.
- 5.BANGOR. Judith Davis, *Jean Hilton*.
- 6.BEAUVAL. Leonie Kennedy-Mills, Peter Kennedy-Mills, Susan Leitch, *Jim Mills*, Clara Sanderson, Rick Sanderson.
- 7.BIGGAR. Kelly Foster, *Guy Wapple*, Megan Wapple, Robert Wapple, Sandra Wapple.
- 8.BIG RIVER. *Carla Braidek*, Jack Braidek, Joan Braideck.
- 9.BIRCH HILLS. Marg Mareschal, *Moe Mareschal*, Don Weidl.
- 10.BRIGHTWATER RESERVOIR. Keith Hobson, Ed Peters, *Alan Smith*.
- 11.BROADVIEW. Marlene Barnes, Ted Barnes, *Dave Chaskavich*, Barbara Weidl, Don Weidl, Tony Weidl.
- 12.BROMHEAD. *Martin Bailey*, Carol Bjorklund.
- 13.CABRI. *Carman Dodge*.
- 14.CHITEK LAKE. *Marcel Cornect*.
- 15.CLARK'S CROSSING. Carol Blenkin, Allyson Brady, Nigel Caulkett, Ron Clarke, Darlene Hay, Jim Hay, Marlene Kalanack, Kay Krueger, Gerard Lahey, Garth Nelson, Hilda Noton, Keith Pahl, Bret Parlee, Chad Parlee, Stan Shadick, Martin Stoffel, Hilda Voth, Jim Wedgwood, Colette Wheler, *Michael Williams*, Jim Wood, Sandra Zdunich.
- 16.CORONACH. Anne Harris, Valeri Harris, *Wayne Harris*.
- 17.CRAVEN. Martin Bailey, Margaret Belcher, Betty Binnie, Carol Bjorklund, Luc Blanchette, Jon Herriot, Kate Herriot, *Trevor Herriot*, Bob Kreba, Bob Luterbach, Ron Myers, Bill Ogilvie, Karyn Scalise, Kaitlyn Semple, Keiran Semple.
- 18.CROOKED LAKE. Bill Livsay, Mayta Livsay, Pat Connolley, Boyd Metzler, John Pollock, *Dorothy Skene*, Ed Skene.
- 19.CROOKED RIVER. *Margaret Mehler*, Morley Mehler.
- 20.CYPRESS HILLS PROVINCIAL PARK (Centre Block). Wayne Harris, Ana Larmour, Brendan Larmour, Debbie Larmour, Don Larmour, Donny Larmour, Marie Larmour, Sean Larmour, Sofia Larmour, Bill MacNab, Jean MacNab, Sue McAdam, *Melody Nagel-Hisey*.
- 21.DILKE. Margaret Belcher, Kent Holland, *Brian McArton*.
- 22.DUCK LAKE. Keith Hobson, *Alan Smith*.
- 23.DUVAL. Enid Cumming, George Herber, Merv Hey, Iain Richardson, *Lloyd Saul*, Steve Van Wilgenberg.
- 24.EASTEND. *Henri Lebastard*.
- 25.EASTEND - CONSUL. Jen Barnes, Evelyn Brown, Robert Gebhardt, *Joan Hodgins*, Adam Scott, Heidi Scott.
- 26.EMMA LAKE. Glen Hanson, Jean Hanson, *Deanna Krug*, Norman Krug.
- 27.ENDEAVOUR. *Norman Harris*.
- 28.ESTEVAN. Anne Harris, Valeri Harris, *Wayne Harris*, Sheila Lamont.
- 29.ESTUARY NORTH. Cathy Cocks, *Dean Francis*.
- 30.FENTON. *Carman Dodge*, Dave Stepnisky, Don Weidl.
- 31.FIFE LAKE. *Martin Myers*, Robert Rafuse.
- 32.FORT QU'APPELLE. Elizabeth Aiken, James Armstrong, Phyllis Bordass, Dorothy Chickowski, Errol Cochrane, Anne Davies, Joanne Davies, Tim Davies, Doug Harman, Lillian Hill, *Ronald Hooper*, Kevin Horseman, Vic Lamontagne, Kaye Lindgren, Jack Lowe, Shirley Lucyk, Don McDougall, Jean McKenna, Allan Mlazgar, Webb Palmer, Paul Paquin, Florence Pearpoint, Lorne



- Rowell, Lloyd Talbot, Gus Vanderpolder, Fred Warren, William Whiting.
- 33.FORT WALSH. Anne Harris, Valeri Harris, Wayne Harris, Ron Jensen, Burke Korol, Sheila Lamont, Susan McAdam, Wilkes Parsonage, Wayne Renaud, *Guy Wapple*, Robert Wapple, Jack Wilkinson, Janet Wilkinson.
- 34.GARDINER DAM. Anne Harris, Valeri Harris, Wayne Harris, Jeff Jensen, Ron Jensen, Burke Korol, Sheila Lamont, Susan McAdam, Wayne Renaud, *Guy Wapple*, Robert Wapple.
- 35.GOOD SPIRIT LAKE. *Bill Anaka*, Joyce Anaka, Julia Wiwchar.
- 36.GOVENLOCK. Anne Harris, Valeri Harris, Wayne Harris, Ron Jensen, Burke Korol, Sheila Lamont, Sue McAdam, Wayne Renaud, *Guy Wapple*, Robert Wapple.
- 37..GRASSLANDS NATIONAL PARK (NW). *Pat Fargey*, Lynn Grant, Sebastian Yarcoux, Heather Peat, Lori Rissling, Lorie Wiesner, Mike Wynn.
- 38.GRAYSON. *Charles Helm*, Daniel Helm, Karl Zimmer.
- 39.HARRIS. *Guy Wapple*.
- 40.HEPBURN. Helen Fehr, Alice Pilatus, *Phyllis Siemens*.
- 41.HOLBIEN. Chlorus Harris, *Helen Harris*.
- 42.HORSESHOE BEND (North of Kinistino). Daveen Berg, Dannelle Messer, *Verna Messer*.
- 43.HUMBOLDT. *Ed Brockmeyer*, Mike Volk.
- 44.INDIAN HEAD. Vic Beaulieu, Irv Escott, *David Gehl*, Roberta Gehl, Ryan Gehl, Gordon Howe, John Kort, Linda Kort, Mary Kort, Allan Nichols, Dora Nichols, Norine Nichols, Laura Poppy, Lorne Scott, Lizza Alarde, Eileen Varley, Gordon Willerth, Garth Willoughby, Kathy Willoughby.
- 45.KAMSACK. John Barisoff, George and Hazel Bernard, Agnes Betz, Mable Buceuk, Marlon Brock, Lindee Dewores, Bill Koroluik, Mary Lawernce, Laura Loeppky, Adline Nykolishen, Kelsey and Ryley Rezansoff, *Isabel Ritchie*, Elsie Severson, Elenor Sookocheef, Stan Stone Sr., Evy Sasyniuk, Joyce and Peter Ualow.
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- 47.KENASTON. *Lawrence Beckie*, Margaret Ann Beckie.
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- 53.LA RONGE. *Jim Paul*, Lorie Ann Paul.
- 54.LAST MOUNTAIN LAKE N.W.A. Valeri Harris, *Wayne Harris*, Sheila Lamont.
- 55.LEADER (North). *Daisy Meyers*.
- 56.LEADER (South). *Brenda Flood*, John Flood.
- 57.LIVELONG. *Sarah Pavka*.
- 58.LOVE - TORCH RIVER. Ken Blaine, Lorna Blaine, *Bert Dalziel*, Duke Dalziel, Joan Dalziel, Kari Dalziel, Nora Dalziel, Sara Dalziel, Anita Deutschmann, Eric Deutschmann, Betty Donovan, Bruce Donovan, Elien L'Heureux, George Lidster, Jean Lidster, Mildred Long, Lynn Matthews, William Matthews.
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- 94.SWIFT CURRENT. James Beattie, Hugh Henry, Jeff Jensen, Julie Jensen, *Ror Jensen*, Velma Kinsman, Dorine Kreuger, Walt Kreuger, Arlyne Lawson, Doug Lawson, Kim Marsden, Sue McAdam, Eloise Miller, Max Miller, Chelsea Stinson, Irene Stinson, Kae Waters, John Weston, Pearl Weston, Verdella Zacharias.
- 95.TISDALE. Carl Mohr, *Joyce Mohr*.
- 96.TOGO. *Doug Elsasser*.
- 97.TURTLE LAKE. Carol Burand, S. Burand, Muriel Carlson, Larry and Enid Eback



Harold Newton, *E.M. Robinson*, Vickie Tollefson.

98.WATSON. Doreen MacDonald, Velma Spizawka, *Patricia Sterzuk*.

99.WELDON. *Ada Hawrish*, Bernard Hawrish.

100.WEYBURN. Mary Bakken, Leo Belanger, Louise Belanger, Sophie Belanger, Greg Bobbitt, Jim Burge, Bob Cameron, Jeff Cameron, Lucille Cameron, Ros Douglas, *Dick Gutfriend*, Betty Layh, Phil Layh, Cy Marcotte, Audrey Michel, John Murray, Ray Neville, Keith Sakatch, Norbert Schultz, Stewart Stairmand, Sid Tripoff, Joe Weisgerber.

101.WHITE BEAR. Darryl Jordheim, Floyd Jordheim, *Sig Jordheim*, Greg McCulloch, Lynette McCulloch.

102.WHITEWOOD. Joe Ashfield, Ellen Blyth, Pat Connalley, Freida Ede, Kelly Finkas, Joyce Jordan, Wilfred Jordens, Bernice Juzyniec, Felix Juzyniec, Jean Meadows, Cindy McKay, Doreen McPhail, Illa Meszanos, *Boyd Metzler*, Erv Miller, John Pollock, Alfred Pritchard, Florence Pritchard, Larry Reichel, Marj Reichel, Lenore Santo, Diane Veresh, Ernie Veresh, Pat Ward, Edwin Wyatt, Elain Wyatt.

103.YORKTON. Bill Anaka, Joyce Anaka, Dale Hjertaas, Elinor Hjertaas, Kerry Hjertaas, Paule Hjertaas, Warren Hjertaas, *Mark Konder*, Boyd Metzlar, Ray Riesz, Geoff Rushowick, Patrick Rushowick, Dorothy Skene, Ed Skene, Harold Wilkinson, Wilma Wilkinson, Julia Wiwchar



Table 1. COUNT WEATHER CONDITIONS (Temperature °C, Wind kmph, Snow cm)

Locality	Min T°C	Max T°C	Min Win	Max Win	Min Sno	Max Sno	AM Sky	PM Sky
1. ANGLIN LAKE	-2	2	0	0	0	3	partly cloudy	partly cloudy
2. ARCHERWILL	-15	0	5	10	10	12	overcast, m. fog, light snow	overcast, light fog, light snow
3. ARMIT	-31	-20	5	25	15	20	clear	clear
4. ASSINIBOIA	-10	-5	5	10	2	5	partly cloudy	partly cloudy
5. BANGOR	-4	-2	15	20	0	0	clear	clear
6. BEAUVAL	-30	-25	0	0	10	15	clear	clear
7. BIGGAR	-10	2	10	40	0	0	partly cloudy	mostly clear
8. BIG RIVER	-8	-2	0	0	0.5	2	mostly clear	mostly clear
9. BIRCH HILLS	-14	-11	6	11	7	10	overcast, lt. snow	overcast
10. BRIGHTWATER	-10	-5	0	5	0	0	partly cloudy	partly cloudy
11. BROADVIEW	-4	-1	5	15	0	0	overcast	overcast
12. BROMHEAD	-2	0	10	15	0	0	partly cloudy	partly cloudy
13. CABRI	-2	-1	0	0	0	0	mostly clear	mostly clear
14. CHITEK LAKE	-8	-2	5	8	0	1	mostly clear	overcast
15. CLARK'S XING	-12	-1	0	10	0	4	mostly clear	mostly clear
16. CORONACH	-3	2	10	30	0	0	clear	clear
17. CRAVEN	-4	2	5	10	0	0	mostly clear	mostly clear
18. CROOKED LAKE	-4	-1	10	25	0	0	partly cloudy	mostly clear
19. CROOKED RIVER	-25	-23	0	0	15	20	overcast	mostly clear
20. CYPRESS P.P.	0	2	0	5	0	10	clear	mostly clear
21. DILKE	-5	5	0	20	0	0	mostly clear	mostly clear
22. DUCK LAKE	-5	0	0	10	0	5	overcast	overcast
23. DUVAL	-9	0	0	28	0	1	overcast	partly cloudy
24. EASTEND		12	0	5	0	0	clear	clear
25. EASTEND	-5	-3	0	0	0	0	clear	clear
26. EMMA LAKE	-3	0	0	5	20	25	overcast; lt. snow	overcast
27. ENDEAVOUR	-20	-5	0	5	0	1	partly cloudy	mostly clear
28. ESTEVAN	-4	2	10	60	0	0	overcast	overcast
29. ESTUARY NORTH	-25	-15	5	10	2	3	partly cloudy	overcast
30. FENTON	-3	-3	0	15	5	10	overcast, lt. snow	overcast, hvy snow
31. FIFE LAKE	-10	-4	5	20	0	0	mostly clear	mostly clear
32. FT. QU'APPELLE	-15	-2	10	15	0	0	clear	clear
33. FORT WALSH	-8	-5	10	30	0	1	overcast	overcast
34. GARDINER DAM	-10	-5	20	30	0	1	mostly clear	mostly clear
35. GOOD SPIRIT L.	-6	0	0	10	0	1	overcast	overcast
36. GOVENLOCK	-6	2	5	30	0	0	mostly clear	mostly clear
37. GRASSLANDS NP	-20	-10	5	10	0	5	clear	partly cloudy
38. GRAYSON	-10	0	0	10	0	1	mostly clear	mostly clear
39. HARRIS	-7	7	10	60	0	1	overcast, lt. rain	partly cloudy
40. HEPBURN	-6	0			0	1	mostly clear	mostly clear
41. HOLBIEN	-6	-6	0	0	0	1	mostly clear	overcast
42. HORSESHOE B.	-9	-9	0	0	0	0	overcast	overcast
43. HUMBOLDT	-5	2	0	20	0	0	partly cloudy	mostly clear
44. INDIAN HEAD	-25	-20	0	5	5	10		mostly clear
45. KAMSACK	-35	-26			60		clear	
46. KELVINGTON	-11	-9	0	0	5	10	overcast	overcast
47. KENASTON	-5	5	10	35	0	1	overcast	partly cloudy
48. KENOSEE LAKE	-6	-2	0	10	0	2	partly cloudy	partly cloudy
49. KILWINNING	-10	-2	0	5	0	1	partly cloudy	partly cloudy
50. KINLOCH	-9	0	5	30	0	5	overcast	partly cloudy
51. KUTAWAGAN L.	-5	0	5	15	0	0	overcast	overcast
52. KYLE	2	2	0	0	0	0	clear	partly cloudy
53. LA RONGE	-6	-4	5	15	4	7	partly cloudy	overcast

Table 1. COUNT WEATHER CONDITIONS (Temperature °C, Wind kmph, Snow cm)

Locality	Min T°C	Max T°C	Min Win	Max Win	Min Sno	Max Sno	AM Sky	PM Sky
54. LAST MT. L. NWA	-10	1	5	25	0	0	partly cloudy	clear
55. LEADER (North)	-10	4	0	20	0	0	partly cloudy	partly cloudy
56. LEADER (South)	-20	-18	37	42	2	5	partly cloudy	partly cloudy
57. LIVELONG	-15	-5	0	0	8	10	clear	clear
58. LOVE - TORCH R.	-20	-10	0	5	10	20	overcast, lt. fog	partly cloudy
59. LUSELAND	-8	-15	0	15	0	3	overcast	partly cloudy
60. MACDOWALL	-24	-18	0	2	8	10	mostly clear	mostly clear
61. MARYFIELD	-8	-3	5	10	0	0	partly cloudy	partly cloudy
62. MAYVIEW	-8	-2	0	0	0	1	overcast, lt. fog	clear
63. MEADOW LAKE	0	1	5	10	0	0	mostly clear	partly cloudy
64. MELFORT								
65. MELVILLE	-6	1	0	0	0	0	clear	clear
66. MISSINIPÉ	-17	-10	0	5	26	29	light fog	moderate fog
67. MOOSE JAW	-4	5	10	19	0	0	mostly clear	mostly clear
68. MOOSE MT.	-14	-3	10	15	0	1	clear	clear
69. NESBIT FOREST	-20	-10	5	15	6	15	overcast, mod. snow	overcast, mod. snow
70. NIPAWIN	-17	-17	0	0	8	8	clear	mostly clear
71. PIKE LAKE	-35	-23	0	10	3	8	clear	partly cloudy
72. PREECEVILLE	-1	0	11	13	0	1	mostly clear	clear
73. PRINCE ALBERT	-3	0	15	20	0	0	Partly cloudy	partly cloudy
74. PR. ALBERT N. P.	-14	-5	5	15	0	4	mostly clear	partly cloudy
75. QU'APPELLE	0	1	15	20	0	1	partly cloudy	mostly clear
76. RAYMORE	-4	3	5	30	0	0	mostly clear	clear
77. REGINA	-13	4	0	10	0	0	clear	clear
78. ROCKGLEN	0	6	0	60	0	0	clear	partly cloudy
79. ROUND L. (Q.V.)	-7	0	0	5	0	0	mostly clear	partly cloudy
80. SALTCOATS	-7	-2	5	10	0	0	partly cloudy	overcast
81. SK LANDING PP	-5	2	10	30	0	0	overcast	overcast
82. SASK R. FORKS	-15	-4	5	10	0	3	partly cloudy	mostly clear
83. SASKATOON	-5	3	0	15	0	2	mostly clear	partly cloudy
84. SCOTT	-5	3	10	40	0	1	overcast	overcast
85. SHAMROCK	-4	1	15	25	0	0	partly cloudy	mostly clear
86. SHAUNAVON	-24	-24					clear	clear
87. SKULL CREEK	4	5	0	0	0	0	partly cloudy	partly cloudy
88. SNOWDEN	-12	0	0	0	0	0.5	clear	mostly clear
89. SPALDING	-5	2	0	0	0	5	mostly clear	mostly clear
90. SPINNEY HILL	-8	3	5	10	0	2	overcast, lt. fog	partly cloudy
91. SPRUCE HOME	-5	-4	0	0	7	19	partly cloudy	partly cloudy
92. SQUAW RAPIDS	-25	-23	2	15	12	15	partly cloudy	partly cloudy
93. ST. LUKE	-2	0	15	15	0	0.5	partly cloudy	partly cloudy
94. SWIFT CURRENT	-5	2	5	40	0	0	partly cloudy	mostly clear
95. TISDALE	-16	0	10	15	0	0	partly cloudy	partly cloudy
96. TOGO								
97. TURTLE LAKE	-10	-6	0	10	3	5	clear	partly cloudy
98. WATSON	-26	-24	0	0	10	15		mostly clear
99. WELDON	-10	0	0	5	0	3	partly cloudy	mostly clear
100. WEYBURN	-8	-5	0	10	0	0	mostly clear	mostly clear
101. WHITE BEAR	0	3	10	15	0	0	clear	clear
102. WHITEWOOD	-12	3	0	5	0	0	mostly clear	mostly clear
103. YORKTON	-20	-10			5	10	clear	clear



Table 2. COUNT COVERAGE

LOCATION	OBSERVERS	KM ON FOOT	HRS ON FOOT	KM BY CAR	HRS BY CAR	HRS FEEDER	% HABITAT											
							EVERGREEN	MIXEDWOOD	DECIDUOUS	ASPEN/FARM	ASPEN/PRAIRIE	PRAIRIE	SEEDED PASTURE	CULTIVATED FIELDS	FARMYARDS	URBAN	OPEN WATER	OTHER
1. ANGLIN LAKE	6	5	5	0	0	3	15	85										
2. ARCHERWILL	6	3	1	0	0	4		10	10						60	20		
3. ARMIT	7	15	7	110	10	0	10	40	40	10								
4. ASSINIBOIA	7	0	0	15	1	0								10	80	10		
5. BANGOR	2	2	1	20	1	3				10	20			10	60			
6. BEAUVAIL	6	5	7	80	6	0	25	60	10				2	1		2		
7. BIGGAR	4	11	5.25	202	10.25	1				21				29	29	21		
8. BIG RIVER	3	4	3	0	0	0.5		70					15	5	5			10a
9. BIRCH HILLS	3	4	1.25	86	5	2			5	30			5	40	10	9	1	
10. BRIGHTWATER	3	3	2	102	7.5	0			15		15	10	5	15	35		5	
11. BROADVIEW	6	4.5	2	124	5.5	0	4		40	40					4	10	2	
12. BROMHEAD	2	0	0	140	6	0								95	5			
13. CABRI	1	3	1	110	2.75	0.5					5	5		75	5	10		
14. CHITEK LAKE	1	6	3	8	1.8			29		18				18		30		5b
15. CLARK'S XING	22	28.3	13.6	567	31.8	0			6	11	5	1	1	16	26	14	6	5b, 9c
16. CORONACH	3	2	2	160	5						10			60	5	5	20	
17. CRAVEN	15	20	6	490	22					20	10	10	10	30	10	7	3	
18. CROOKED L.	7	2	1	201	8	1			20	20				10	10	20	20	
19. CROOKED R.	2	1	1	25	0.75	3				25				25	50			
20. CYPRESS PP	13	15	4	50	4	3	60	20				10			10			
21. DILKE	3	0	0	61	1	3				25					1	74		
22. DUCK LAKE	2	6	3	95	5.25			60	10	15	5					10		
23. DUVAL	6	7	3	256	10	1			12	5	5	5	1	35	27	10		
24. EASTEND	1				5		5		40					30	5	20		
25. EASTEND	6			150	3	1						95		1	2	2		
26. EMMA LAKE	4	2	0.5	55	3	3		95							5			
27. ENDEAVOUR	1	2	2.5	30	1.5	2			25					20	50	25		
28. ESTEVAN	4	7	3	150	6				20			20		20		20	20	
29. ESTUARY N.	2	1	2	70	3	2			25			45		30				
30. FENTON	3	2	0.5	140	4.5	1				10			5	60	15	5	5	
31. FIFE LAKE	2	0.5	0.5	100	6							5		75	5		15	
32. FT QU'APPELLE	27	3	3	300	10	3			10	20		5	5	30	10	10	10	
33. FORT WALSH	13	61	30.5	134	28.75			53				1		7	7			32c
34. GARDINER DAM	11	51	25.5	371	23.5					1				31	30		24	14c
35. GOOD SPIRIT L.	3	3	1.5	102	4.2	4	2	3	5	20	40	2	5	20	2	1		
36. GOVENLOCK	10	16	8	300	13							50		25	25			
37. GRASSLANDS	7	1.5	0.75	200	7.5							50		25	20	5		
38. GRAYSON	3	1	1	50	6	0.5				40				5	20	5	30	
39. HARRIS	1	6	2.75	178	6					23		6		30	30	11		
40. HEPBURN	3	1	1	45	2	2				10				30	20	40		
41. HOLBIEN	2	1	1			3	5	25	20	0	15	0	0	10	25			
42. HORSESHOE B.	2	1.5	1			2		20					10		70			
43. HUMBOLDT	2	6	3	50	5					70					20	10		
44. INDIAN HEAD	20	12	9	185	12	10				20	20	5		20	20	10	5	
45. KAMSACK	22																	
46. KELVINGTON	3			60	2.5	6				15				25	60			
47. KENASTON	2	2	1	162	6	2				10	5		25	40	15	5		
48. KENOSEE LAKE	2	1	1	58	3				20							80		
49. KILWINNING	3	1	0.5	120	5		2	5	5	30	10		8	9	20	1		
50. KINLOCH	9	9	3.5	96	2	5	35	35	15	10					5			
51. KUTAWAGAN L.	3	2	1	200	5					20	10	10		40	10	10		
52. KYLE	2			115	4						10	15		70	5			
53. LA RONGE	2	5	1	70	4	0.5		45								50	5	
54. LAST MT. L.	3	3	2	215	5					10		30		50	5	4	1	
55. LEADER (North)	1	4	3	20	2	1						50		30	10	10		

Table 2. COUNT COVERAGE (continued)

LOCATION	OBSERVERS	KM ON FOOT	HRS ON FOOT	KM BY CAR	HRS BY CAR	HRS FEEDER	% HABITAT											
							EVERGREEN	MIXEDWOOD	DECIDUOUS	ASPEN/FARM	ASPEN/PRAIRIE	PRAIRIE	SEEDED PASTURE	CULTIVATED FIELDS	FARMYARDS	URBAN	OPEN WATER	OTHER
56. LEADER (South)	2			85	3	4						40		60				
57. LIVELONG	1	4	1.5			4				5					5	90		
58. LOVE-TORCH R.	18	1	1	30	2	14		25						10	40	25		
59. LUSELAND	5	8	4	151	4.5	2				60	10	10		5	5	10		
60. MACDOWALL	1	4	2	40	3	4		10	25	50				10	5			
61. MARYFIELD	3	1	1	80	3					40			5	40	10	5		
62. MAYVIEW	2	5	1			2		70						30				
63. MEADOW LAKE	5	15	4	110	4	3		10						10	14	66		
64. MELFORT	2																	
65. MELVILLE	4	3	4	60	4	4				5		60			25	10		
66. MISSINUIPE	1	3	1.75			3		28										
67. MOOSE JAW	37	17	8	100	10.5	5								10		72		45c
68. MOOSE MT.	5	2	1	145	5				30	40					10	20		
69. NESBIT FOR.	6			450	5.5	6	25				70					5		
70. NIPAWIN	9	1	1	9	1	7												
71. PIKE LAKE	46	32.3	23.2	462.5	17	0.5			10	5	10	5		20	30	20		
72. PREECEVILLE	13	9	3.5	110	4.5	10												
73. PRINCE ALBERT	44	61	22	464	28.25	3	25	10	5				5		5	45	5	
74. PR. ALBERT NP.	28	54.5	20.5	81.5	5	3	20	50	20							5	5	
75. QU'APPELLE	4	4.2	4.6	230	5.6			1	14	5	4	4.5	13	18	16	6	14	4.5c
76. RAYMORE	4	5	3	231	7	1				70				10	10	10		
77. REGINA	39	68	26	670	24	5			4	5		5		30	15	40	1	
78. ROCKGLEN	2	1	0.5	70	6							10	10	80				
79. ROUND LAKE	4			206	9			5		40	10			25			20	
80. SALTCOATS	5	5	3	75	4					20	10			40	10	20		
81. SK. LANDING PP.	7	5	3	150	10							30		30	5		1	4a, 30c
82. SASK. R. FORKS	3	3	2	71	3.5		10	20	5	5			5	40	5		10	
83. SASKATOON	82	142	70.4	899.1	54.7	71.5	0.5	3	7	12	7	1	3	5	11	40	5	0.5b,5c
84. SCOTT	2	5	2.5	177	6									41	41	18		
85. SHAMROCK	1	0.5	0.5	93	3.5								10	70	20			
86. SHAUNAVON	11		3.5		8									25	25	25		25d
87. SKULL CREEK	11			160	6	2				30	20	10		20	20			
88. SNOWDEN	16	4	2	125	8	5		10							75	15		
89. SPALDING	2	3	1	45	3	2		40							20	40		
90. SPINNEY HILL	2	2	1	135	6		1		10	40	10	5	5	24	5		T	
91. SPRUCE HOME	2					3		50		50								
92. SQUAW RAPIDS	6	20	8	130	8		10	60	10		10						10	
93. ST. LUKE	6	2	1.5	30	2	3	0	0	25	20	15	5	10	15	10			
94. SWIFT CURRENT	21	30	13.5	415	15.75	9.5						5		35	5	55		
95. TISDALE	2				1		10							10		80		
96. TOGO	1																	
97. TURTLE LAKE	8							100										
98. WATSON	3	1	1	52	3	1.5			25		25			25	15	10		
99. WELDON	2			20	1.5	2		50								50		
100. WEYBURN	22	5	2	379	34							5		54	10	30	1	
101. WHITE BEAR	5	20.7	7	33	1	0.25						75		15	10			
102. WHITEWOOD	26	8	5.5	359	15.5	24.5				20				5	25	50		
103. YORKTON	17	12	4	180	13					20	20				10	50		

<sup>a</sup> frozen lake; <sup>b</sup> garbage dump; <sup>c</sup> riparian



1. ANGLIN LAKE
2. ARCHERWILL
3. ARMIT
4. ASSINIBOIA
5. BANGOR
6. BEAUVAL
7. BIGGAR
8. BIG RIVER
9. BIRCH HILLS
10. BRIGHTWATER RESERVOIR
11. BROADVIEW
12. BROMHEAD
13. CABRI
14. CHITEK LAKE
15. CLARK'S CROSSING
16. CORONACH
17. CRAVEN

18. CROOKED LAKE
19. CROOKED RIVER
20. CYPRESS HILLS PROV. PARK
21. DILKE
22. DUCK LAKE
23. DUVAL
24. EASTEND
25. EASTEND -- CONSUL
26. EMMA LAKE
27. ENDEAVOUR
28. ESTEVAN
29. ESTUARY NORTH
30. FENTON
31. FIFE LAKE
32. FORT QU'APPELLE
33. FORT WALSH
34. GARDINER DAM

35. GOOD SPIRIT LAKE
36. GOVENLOCK
37. GRASSLANDS N. P (NW)
38. GRAYSON
39. HARRIS
40. HEPBURN
41. HOLBIEN
42. HORSESHOE BEND
43. HUMBOLDT
44. INDIAN HEAD
45. KAMSACK
46. KELVINGTON
47. KENASTON
48. KENOSEE LAKE
49. KILWINNING
50. KINLOCH
51. KUTAWAGAN LAKE
52. KYLE
53. LA RONGE
54. LAST MOUNTAIN L. NWA
55. LEADER (North)
56. LEADER (South)
57. LIVELONG
58. LOVE -- TORCH RIVER
59. LUSELAND
60. MACDOWALL
61. MARYFIELD
62. MAYVIEW
63. MEADOW LAKE
64. MELFORT
65. MELVILLE
66. MISSINUIPE
67. MOOSE JAW
68. MOOSE MOUNTAIN
69. NESBIT FOREST WEST
70. NIPAWIN
71. PIKE LAKE
72. PREECEVILLE
73. PRINCE ALBERT
74. PRINCE ALBERT N. PARK
75. QU'APPELLE VALLEY DAM
76. RAYMORE
77. REGINA
78. ROCKGLEN -- BORDERLAND
79. ROUND LAKE (QU'APPELLE)
80. SALT COARS
81. SASK. LANDING P. PARK
82. SASKATCHEWAN R. FORKS
83. SASKATOON
84. SCOTT
85. SHAMROCK
86. SHAUNAVON
87. SKULL CREEK
88. SNOWDEN
89. SPALDING
90. SPINNEY HILL
91. SPRUCE HOME
92. SQUAW RAPIDS
93. ST. LUKE (NE of Whitewood)
94. SWIFT CURRENT
95. TISDALE
96. TOGO
97. TURTLE LAKE
98. WATSON
99. WELDON
100. WEYBURN
101. WHITE BEAR
102. WHITEWOOD
103. YORKTON

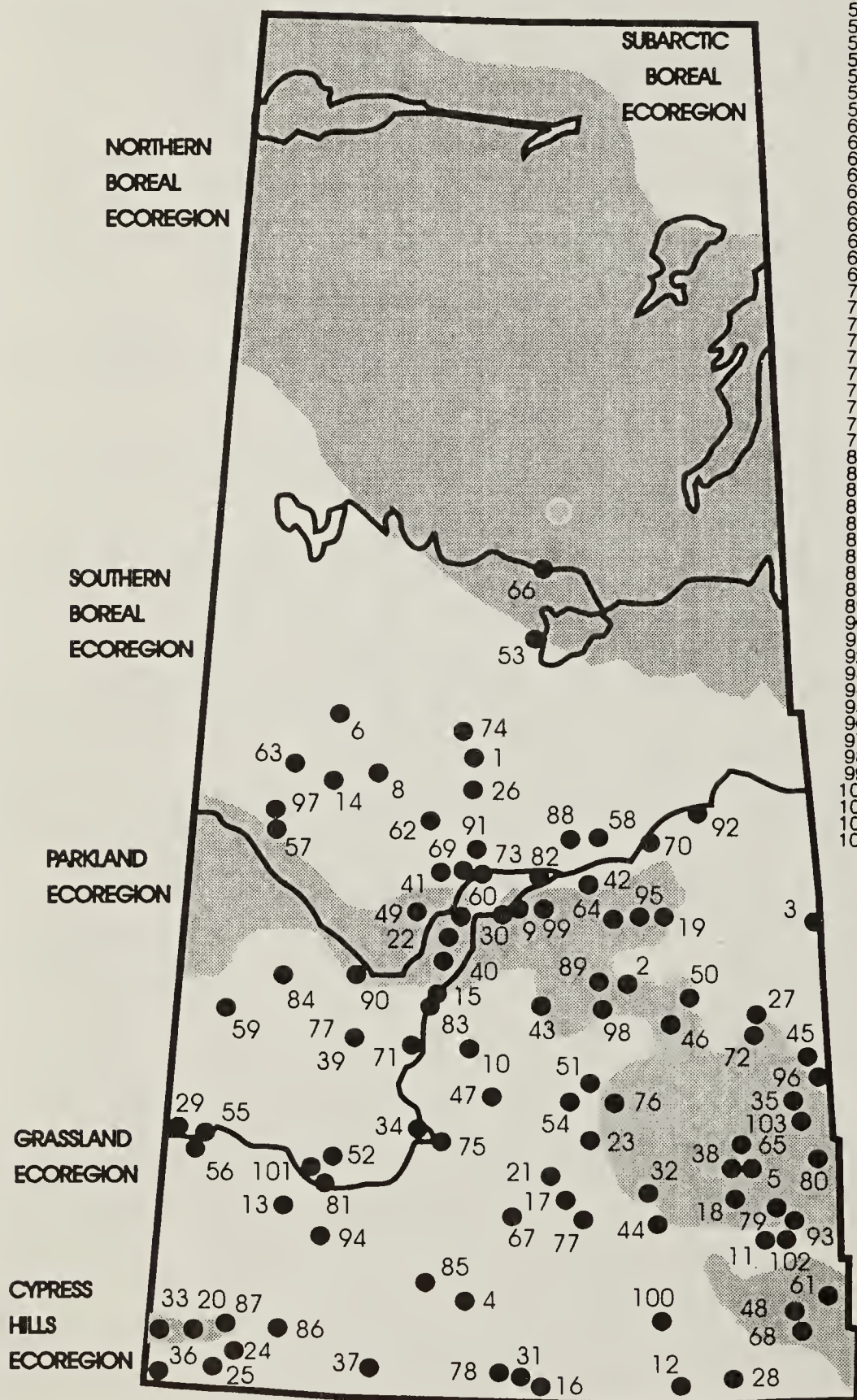


Figure 1. Location of 1997 counts (numbers correspond to locality names in Tables).



Table 3-1. SPECIES RECORDED FROM MORE THAN NINE LOCALITIES  
(+ = species seen during the count period but not on count day)

SPECIES	LOCALITY & DATE	1. ANGLIN LAKE 26 December 1997	2. ARCHERWILL 30 December 1997	3. ARMIT 03 January 1998	4. ASSINIBOIA 4 January 1998	5. BANGOR 21 December 1997	6. BEAUVAL 4 January 1998	7. BIGGAR 24 December 1997	8. BIG RIVER 27 December 1997	9. BIRCH HILLS 30 December 1997
CANADA GOOSE										3
MALLARD								4		
COMMON GOLDENEYE										
BALD EAGLE						+				
NORTHERN GOSHAWK				2			1			
ROUGH-LEGGED HAWK				1		+				
GOLDEN EAGLE					1			2		
MERLIN								1		
GRAY PARTRIDGE					29					22
RING-NECKED PHEASANT										
RUFFED GROUSE		1	7	20		3	1		+	1
SHARP-TAILED GROUSE				24	18	4	+	93		
ROCK DOVE						8		155		21
GREAT HORNED OWL				1	2		1	2		1
SNOWY OWL					1					2
DOWNY WOODPECKER		3	6	2		8	1	2		4
HAIRY WOODPECKER		4	8	4		4	3		1	3
BLACK-BACKED WOODPECKER				1						
NORTHERN FLICKER (Y-S)										
PILEATED WOODPECKER				1			1			
HORNED LARK										
GRAY JAY		8	4	11			5		2	
BLUE JAY		9	30	4	2		12	2	2	
BLACK-BILLED MAGPIE			11	28	48	38	27	155	1	65
COMMON RAVEN		11	7	74		37	48	2	1	7
BLACK-CAPPED CHICKADEE		22	31	31	2	60	13	25	3	34
BOREAL CHICKADEE		5	4	12			1	3	2	
RED-BREASTED NUTHATCH		2	3	1		4	1	8	3	
WHITE-BREASTED NUTHATCH			2	1					2	
GOLDEN-CROWNED KINGLET								5		
AMERICAN ROBIN										
BOHEMIAN WAXWING						+		2		177
CEDAR WAXWING										
NORTHERN SHRIKE										
EUROPEAN STARLING								27		6
DARK-EYED JUNCO (S-C)										
SNOW BUNTING				155	6	+	2			13
PINE GROSBEAK		5	25	41		21	18	2	2	8
PURPLE FINCH							+			
HOUSE FINCH										
COMMON REDPOLL			4	232		45	11	49		7
HOARY REDPOLL				3						
PINE SISKIN										
EVENING GROSBEAK		20	297	16		20	47			
HOUSE SPARROW			32	7	270	42		610		230
TOTAL INDIVIDUALS COUNT DAY		91	471	675	419	294	197	1151	19	605
NO. SPECIES COUNT DAY		12	15	25	11	13	20	21	10	18
NO. SPECIES COUNT PERIOD		12	15	25	11	17	24	21	11	18
NO. INDIVIDUALS IN TABLES 4 & 5		1	0	3	40	0	4	2	0	1
NO. SPECIES IN TABLES 4 & 5		1	0	3	1	0	5	2	0	1



Table 3-2. SPECIES RECORDED FROM MORE THAN NINE LOCALITIES  
(+ = species seen during the count period but not on count day)

10. BRIGHTWATER 20 December 1997	11. BROADVIEW 27 December 1997	12. BROMHEAD 31 December 1997	13. CABRI 25 December 1997	14. CHITEK LAKE 21 December 1997	15. CLARK'S XING 20 December 1997	16. CORONACH 24 December 1997	17. CRAVEN 20 December 1997	18. CROOKED LAKE 22 December 1997	LOCALITY & DATE	SPECIES
					36	5700		258		CANADA GOOSE
					1	17000	7	297		MALLARD
1					51	8		1		COMMON GOLDENEYE
2	1							3		BALD EAGLE
										NORTHERN GOSHAWK
			1							ROUGH-LEGGED HAWK
1						5	2	4		GOLDEN EAGLE
					1					MERLIN
			17		28		10			GRAY PARTRIDGE
		1								RING-NECKED PHEASANT
	2						1	1		RUFFED GROUSE
13		37			15		8			SHARP-TAILED GROUSE
43	61		26		182	45	70	110		ROCK DOVE
+	1	2	3		2		1			GREAT HORNED OWL
1	+		5		7	1	3	1		SNOWY OWL
1	3				5		4	1		DOWNY WOODPECKER
2	4			1	3		7	2		HAIRY WOODPECKER
										BLACK-BACKED WOODPECKER
					1					NORTHERN FLICKER (Y-S)
										PILEATED WOODPECKER
		2				1				HORNED LARK
				2						GRAY JAY
	2			4	1		33	7		BLUE JAY
61	47	2	9	33	358	10	141	34		BLACK-BILLED MAGPIE
8	22			116	15			10		COMMON RAVEN
14	35			14	97		84	104		BLACK-CAPPED CHICKADEE
				7						BOREAL CHICKADEE
1	7		1				5	2		RED-BREASTED NUTHATCH
	2						9	10		WHITE-BREASTED NUTHATCH
2										GOLDEN-CROWNED KINGLET
					5		3	+		AMERICAN ROBIN
	173				553		22	140		BOHEMIAN WAXWING
					21					CEDAR WAXWING
								2		NORTHERN SHRIKE
					34	1				EUROPEAN STARLING
					1					DARK-EYED JUNCO (S-C)
1	3			1	32	62				SNOW BUNTING
9	14			6	54		4	3		PINE GROSBEAK
								+		PURPLE FINCH
	1									HOUSE FINCH
11	2				76		15	3		COMMON REDPOLL
							1			HOARY REDPOLL
	2									PINE SISKIN
				38						EVENING GROSBEAK
395	233	99	95		2191	110	463	151		HOUSE SPARROW
568	623	143	157	222	3821	23038	895	1145		TOTAL INDIVIDUALS COUNT DAY
19	20	6	8	10	25	29	23	22		NO. SPECIES COUNT DAY
20	21	6	8	10	25	29	23	25		NO. SPECIES COUNT PERIOD
2	8	0	0	0	51	95	2	1		NO. INDIVIDUALS IN TABLES 4 & 5
2	1	0	0	0	2	18	2	2		NO. SPECIES IN TABLES 4 & 5

Table 3-3. SPECIES RECORDED FROM MORE THAN NINE LOCALITIES  
(+ = species seen during the count period but not on count day)

SPECIES	LOCALITY & DATE	19. CROOKED RIVER 02 January 1998	20. CYPRESS P.P. 30 December 1997	21. DILKE 31 December 1997	22. DUCK LAKE 28 December 1997	23. DUVAL 28 December 1997	24. EASTEND 21 December 1997	25. EASTEND-CONSUL 31 December 1997	26. EMMA LAKE 30 December 1997	27. ENDEAVOUR 20 December 1997	28. ESTEVAN 27 December 1997
CANADA GOOSE											27800
MALLARD											1370
COMMON GOLDENEYE											8
BALD EAGLE							4	1			
NORTHERN GOSHAWK											
ROUGH-LEGGED HAWK			5								
GOLDEN EAGLE				+		+	1	4			2
MERLIN			1	1				2			
GRAY PARTRIDGE		+									
RING-NECKED PHEASANT							4				
RUFFED GROUSE		2	3			1				1	
SHARP-TAILED GROUSE				+		+		5			
ROCK DOVE				7	50	9		10		6	11
GREAT HORNED OWL		+		+	1	6	2	5		+	1
SNOWY OWL				1				2			3
DOWNY WOODPECKER		2	2			6			1	+	1
HAIRY WOODPECKER		2	1		1	7			3	1	
BLACK-BACKED WOODPECKER					1				+		
NORTHERN FLICKER (Y-s)											
PILEATED WOODPECKER										1	
HORNED LARK						1		50			
GRAY JAY		2			2				7	1	
BLUE JAY		2		+	3	22			12	2	
BLACK-BILLED MAGPIE		4	60	2	17	35	9		3	9	18
COMMON RAVEN		52			22	2			207	67	
BLACK-CAPPED CHICKADEE		10	90	2	16	20	12	5	56	13	3
BOREAL CHICKADEE					11				12		
RED-BREASTED NUTHATCH			27	2	2			1	9	1	2
WHITE-BREASTED NUTHATCH									+	3	1
GOLDEN-CROWNED KINGLET											
AMERICAN ROBIN											
BOHEMIAN WAXWING			23		80	8		50			40
CEDAR WAXWING											
NORTHERN SHRIKE											
EUROPEAN STARLING			28								
DARK-EYED JUNCO (S-C)		1	1								
SNOW BUNTING		55		+		7		6		+	310
PINE GROSBEAK		8			20				38	13	
PURPLE FINCH							1	2			
HOUSE FINCH											4
COMMON REDPOLL		+				26			15	6	
HOARY REDPOLL											
PINE SISKIN							6				
EVENING GROSBEAK		59	15		12	+			13	56	
HOUSE SPARROW		+	11	15	93	852	100	50			290
TOTAL INDIVIDUALS COUNT DAY		199	288	30	339	1002	139	194	376	180	29870
NO. SPECIES COUNT DAY		12	17	7	17	14	9	15	12	14	19
NO. SPECIES COUNT PERIOD		16	17	12	17	17	9	15	14	17	19
NO. INDIVIDUALS IN TABLES 4 & 5		0	21	0	8	0	0	1	0	0	6
NO. SPECIES IN TABLES 4 & 5		0	4	0	2	0	0	1	0	0	3



Table 3-4. SPECIES RECORDED FROM MORE THAN NINE LOCALITIES  
(+ = species seen during the count period but not on count day)

29. ESTUARY NORTH 04 January 1998	30. FENTON 29 December 1997	31. FIFE LAKE 27 December 1997	32. FT QU'APPELLE 19 December 1997	33. FORT WALSH 20 December 1997	34. GARDINER DAM 22 December 1997	35. GOOD SPIRIT L. 23 December 1997	36. GOVENLOCK 21 December 1997	37. GRASSLANDS NP 19 December 1997	38. GRAYSON 26 December 1997	LOCALITY & DATE	SPECIES
		7240	5375		3126						CANADA GOOSE
		2893	95	8	2580		4		187		MALLARD
		14	13		78						COMMON GOLDENEYE
	1	1	11	2	17		3		4		BALD EAGLE
			+		1						NORTHERN GOSHAWK
				2			5				ROUGH-LEGGED HAWK
+		3	+	2	2		3				GOLDEN EAGLE
1							1				MERLIN
+			+	9			+	30			GRAY PARTRIDGE
21				3			7	1			RING-NECKED PHEASANT
	1		1	5		2			3		RUFFED GROUSE
11	30			20	4		40	38			SHARP-TAILED GROUSE
22	1		19	1	93	7					ROCK DOVE
+	1		1	1	10	1	7	3			GREAT HORNED OWL
1	1	3	+	1	3		4	7			SNOWY OWL
1	3		13	3	1	1			3		DOWNY WOODPECKER
	4		6	5	1	4			3		HAIRY WOODPECKER
											BLACK-BACKED WOODPECKER
								2			NORTHERN FLICKER (Y-S)
											PILEATED WOODPECKER
	+	5		1	1		235		14		HORNED LARK
			1			+					GRAY JAY
7	+		22	1	12	2		3	2		BLUE JAY
17	20		51	159	221	10	18	44	26		BLACK-BILLED MAGPIE
	6		11		5	18			4		COMMON RAVEN
4	15		122	251	21	24			27		BLACK-CAPPED CHICKADEE
											BOREAL CHICKADEE
			4	123	2						RED-BREASTED NUTHATCH
			14			4					WHITE-BREASTED NUTHATCH
				32							GOLDEN-CROWNED KINGLET
			8	1	1						AMERICAN ROBIN
	49		72	25	1	62					BOHEMIAN WAXWING
											CEDAR WAXWING
				3	1				1		NORTHERN SHRIKE
				1	52		6				EUROPEAN STARLING
				78	1		1				DARK-EYED JUNCO (S-C)
+	51			90	202		343	2			SNOW BUNTING
	2		8	8	1	5					PINE GROSBEAK
			+								PURPLE FINCH
			+								HOUSE FINCH
	19	2	35	227	58	5	23				COMMON REDPOLL
					2						HOARY REDPOLL
			+	80							PINE SISKIN
9			+								EVENING GROSBEAK
5	31	15	250	132	1036	120	458	15	50		HOUSE SPARROW
108	235	10186	6148	1488	7669	266	1210	146	329		TOTAL INDIVIDUALS COUNT DAY
12	16	12	23	43	40	15	27	11	15		NO. SPECIES COUNT DAY
16	18	12	40	43	40	16	29	11	15		NO. SPECIES COUNT PERIOD
9	0	3	16	214	136	1	52	1	5		NO. INDIVIDUALS IN TABLES 4 & 5
1	0	3	11	15	13	1	13	1	3		NO. SPECIES IN TABLES 4 & 5

Table 3-5. SPECIES RECORDED FROM MORE THAN NINE LOCALITIES  
(+ = species seen during the count period but not on count day)

SPECIES	LOCALITY & DATE	39. HARRIS 29 December 1997	40. HEPBURN 31 December 1997	41. HOLBIEN 27 December 1997	42. HORSESHOE BEND 30 December 1997	43. HUMBOLDT 27 December 1997	44. INDIAN HEAD 03 January 1998	45. KAMSACK 04 January 1998	46. KELVINGTON 30 December 1997	47. KENASTON 29 December 1997	48. KENOSEE LAKE 26 December 1997
CANADA GOOSE							240				
MALLARD							650				
COMMON GOLDENEYE											
BALD EAGLE					2		3				
NORTHERN GOSHAWK											
ROUGH-LEGGED HAWK											
GOLDEN EAGLE							1	1		1	
MERLIN	1										
GRAY PARTRIDGE	16		2				18			+	
RING-NECKED PHEASANT							1				
RUFFED GROUSE					1	2	2	20	6		1
SHARP-TAILED GROUSE	88					41	8	4	1	+	
ROCK DOVE	124					300	84		10	42	
GREAT HORNED OWL	1						2		+	+	1
SNOWY OWL	1					+	5			1	
DOWNY WOODPECKER			+	2	2	1	4	7	3		1
HAIRY WOODPECKER			+	2	1	+	5	11	4		2
BLACK-BACKED WOODPECKER							4				
NORTHERN FLICKER (Y-S)											
PILEATED WOODPECKER								2			
HORNED LARK										+	
GRAY JAY					2			4			
BLUE JAY			4	3	3	+	13	60	7	2	15
BLACK-BILLED MAGPIE	116	2	11	6	28	97	15	1	20	3	
COMMON RAVEN	1		3	7	7	16	10	9			+
BLACK-CAPPED CHICKADEE	2	5	10	14	32	58	115	18	2	61	
BOREAL CHICKADEE			1	3			2				
RED-BREASTED NUTHATCH				1	3	24	12				2
WHITE-BREASTED NUTHATCH			1	1		8	5	1			7
GOLDEN-CROWNED KINGLET											7
AMERICAN ROBIN						+	1				
BOHEMIAN WAXWING						14		200			48
CEDAR WAXWING		110									+
NORTHERN SHRIKE							1				
EUROPEAN STARLING						30					
DARK-EYED JUNCO (S-C)								24	1		
SNOW BUNTING	23			6	1	475	100	350		+	
PINE GROSBEAK			25	13	1	20	99	14			12
PURPLE FINCH											15
HOUSE FINCH											1
COMMON REDPOLL	9		3	33	2	120	105	32	5	41	
HOARY REDPOLL			2								
PINE SISKIN				1		4	108				28
EVENING GROSBEAK			10	25			685	40			50
HOUSE SPARROW	711	16			200	132	70	50	140	62	
TOTAL INDIVIDUALS COUNT DAY	1093	137	75	123	662	1999	1661	553	214	359	
NO. SPECIES COUNT DAY	12	5	13	19	14	30	23	17	9	20	
NO. SPECIES COUNT PERIOD	12	7	13	19	18	30	23	18	14	22	
NO. INDIVIDUALS IN TABLES 4 & 5	0	0	0	2	0	3	2	6	1	2	
NO. SPECIES IN TABLES 4 & 5	0	0	0	2	0	3	1	1	1	2	



Table 3-6. SPECIES RECORDED FROM MORE THAN NINE LOCALITIES  
(+ = species seen during the count period but not on count day)

49. KILWINNING 20 December 1997	50. KINLOCH 23 December 1997	51. KUTAWAGAN L. 28 December 1997	52. KYLE 24 December 1997	53. LA RONGE 26 December 1997	54. LAST MOUNTAIN 26 December 1997	55. LEADER (North) 30 December 1997	56. LEADER (South) 04 January 1998	57. LIVELONG 31 December 1997	58. LOVE - TORCH R 30 December 1997	LOCALITY & DATE	SPECIES
											CANADA GOOSE
											MALLARD
				2							COMMON GOLDENEYE
								+			BALD EAGLE
	+			+					+		NORTHERN GOSHAWK
1											ROUGH-LEGGED HAWK
						+					GOLDEN EAGLE
											MERLIN
5		6	8		17	8			+		GRAY PARTRIDGE
						5					RING-NECKED PHEASANT
1	+							1	4		RUFFED GROUSE
23		22			32	6					SHARP-TAILED GROUSE
40	+	5	2		255			+	17		ROCK DOVE
	+	1			2	1					GREAT HORNED OWL
1		1			3						SNOWY OWL
2	1	1				2		2	7		DOWNY WOODPECKER
1	4	1		2				4	7		HAIRY WOODPECKER
	+										BLACK-BACKED WOODPECKER
		1									NORTHERN FLICKER (Y-S)
	+								3		PILEATED WOODPECKER
1											HORNED LARK
1	6			2					16		GRAY JAY
10	3	2		3		4	3	4	20		BLUE JAY
24	10	73	8		94	15	23	2	17		BLACK-BILLED MAGPIE
14	17			118				5	68		COMMON RAVEN
9	11	2		7	1			12	69		BLACK-CAPPED CHICKADEE
3	2			1							BOREAL CHICKADEE
1	2						2	+			RED-BREASTED NUTHATCH
2	4							2	10		WHITE-BREASTED NUTHATCH
											GOLDEN-CROWNED KINGLET
											AMERICAN ROBIN
150		45	31			50		10	+		BOHEMIAN WAXWING
							12				CEDAR WAXWING
											NORTHERN SHRIKE
2											EUROPEAN STARLING
											DARK-EYED JUNCO (S-C)
	+	600			125			40	5		SNOW BUNTING
3	11			9				30	15		PINE GROSBEAK
											PURPLE FINCH
											HOUSE FINCH
20				52	3			20	34		COMMON REDPOLL
									1		HOARY REDPOLL
2									3		PINE SISKIN
15	6			121				+	302		EVENING GROSBEAK
65	3	420	2		803	6	30	5	39		HOUSE SPARROW
397	91	1180	51	317	1335	97	71	139	639		TOTAL INDIVIDUALS COUNT DAY
25	16	14	5	10	10	9	6	15	20		NO. SPECIES COUNT DAY
25	25	14	5	11	10	10	6	19	23		NO. SPECIES COUNT PERIOD
1	11	0	0	0	0	0	1	2	2		NO. INDIVIDUALS IN TABLES 4 & 5
1	5	0	0	0	0	0	1	2	2		NO. SPECIES IN TABLES 4 & 5

Table 3-7. SPECIES RECORDED FROM MORE THAN NINE LOCALITIES  
(+ = species seen during the count period but not on count day)

SPECIES	LOCALITY & DATE	59. LUSELAND 02 January 1998	60. MACDOWALL 03 January 1998	61. MARYFIELD 23 December 1997	62. MAYVIEW 21 December 1997	63. MEADOW LAKE 26 December 1997	64. MELFORT 23 December 1997	65. MELVILLE 22 December 1997	66. MISSINUIPE 29 December 1997	67. MOOSE JAW 26 December 1997	68. MOOSE MT. 19 December 1997
CANADA GOOSE								+			
MALLARD											
COMMON GOLDENEYE											
BALD EAGLE								+			
NORTHERN GOSHAWK											
ROUGH-LEGGED HAWK										1	
GOLDEN EAGLE											
MERLIN	+									3	
GRAY PARTRIDGE	21		27							35	
RING-NECKED PHEASANT			1							4	
RUFFED GROUSE		3	1	1	+						
SHARP-TAILED GROUSE	5		8							5	4
ROCK DOVE	19	40	6		70	50	3			255	28
GREAT HORNED OWL	+	+	3		+		1			7	
SNOWY OWL	2			1		1	2			3	
DOWNY WOODPECKER	1	4	1		1	3	1	+		21	5
HAIRY WOODPECKER	1	4					2	1		4	5
BLACK-BACKED WOODPECKER				1							
NORTHERN FLICKER (Y-S)	+									10	2
PILEATED WOODPECKER		+		1				+			
HORNED LARK	1		17								
GRAY JAY	1	4		5	+			3			
BLUE JAY	+	8		3	1	5		2		24	9
BLACK-BILLED MAGPIE	29		12		33	10	5			114	24
COMMON RAVEN		12	1	3	104		2	1			
BLACK-CAPPED CHICKADEE	+	24		5	14	23	40	3		33	40
BOREAL CHICKADEE				1			25	1			
RED--BREASTED NUTHATCH	1	2		2	1	3				31	
WHITE-BREASTED NUTHATCH				1	1					11	2
GOLDEN-CROWNED KINGLET											
AMERICAN ROBIN	+		1							1	
BOHEMIAN WAXWING	97				70	30					
CEDAR WAXWING							70				
NORTHERN SHRIKE											
EUROPEAN STARLING										39	
DARK-EYED JUNCO (S-C)											
SNOW BUNTING	425	+	10							4	
PINE GROSBEAK		6		12	15		16	3		6	14
PURPLE FINCH										7	8
HOUSE FINCH										40	
COMMON REDPOLL	28	6			39		25	4			70
HOARY REDPOLL											
PINE SISKIN								+		40	12
EVENING GROSBEAK		6		23	67		1	6			
HOUSE SPARROW	94	1	40		79	25	30			396	64
TOTAL INDIVIDUALS COUNT DAY	725	120	128	59	495	150	223	24	1096	288	
NO. SPECIES COUNT DAY	14	13	13	13	13	9	14	9	26	15	
NO. SPECIES COUNT PERIOD	20	17	13	13	16	9	16	12	27	15	
NO. INDIVIDUALS IN TABLES 4 & 5	0	0	0	0	0	0	0	0	2	1	
NO. SPECIES IN TABLES 4 & 5	0	1	0	0	0	0	0	0	3	1	



Table 3-8. SPECIES RECORDED FROM MORE THAN NINE LOCALITIES  
(+ = species seen during the count period but not on count day)

69. NESBIT FOREST 01 January 1998	70. NIPAWIN 30 December 1997	71. PIKE LAKE 03 January 1998	72. PREECEVILLE 21 December 1997	73. PRINCE ALBERT 21 December 1997	74. P. A. N. P. 21 December 1997	75. QU'APPELLE DAM 21 December 1997	76. RAYMORE 25 December 1997	77. REGINA 26 December 1997	78. ROCKGLEN 31 December 1997	LOCALITY & DATE  SPECIES
						2786		4147		CANADA GOOSE
						2526		70		MALLARD
				3		35				COMMON GOLDENEYE
		+	+	1	2	11				BALD EAGLE
1							+			NORTHERN GOSHAWK
		1	1						1	ROUGH-LEGGED HAWK
		1				1			+	GOLDEN EAGLE
							+	1		MERLIN
		10					+	32	+	GRAY PARTRIDGE
1								2		RING-NECKED PHEASANT
	+	4	4	5	17		3			RUFFED GROUSE
		98		1			+		104	SHARP-TAILED GROUSE
		60	3	1035		16	7	717		ROCK DOVE
1		3		3		1	1	13	1	GREAT HORNED OWL
		+		+		6	+	36	1	SNOWY OWL
1	1	19	7	11		2	+	9		DOWNY WOODPECKER
1	1	20	9	15	1	2	1			HAIRY WOODPECKER
					3			1		BLACK-BACKED WOODPECKER
		2		3				14		NORTHERN FLICKER (Y-S)
			1	+	2					PILEATED WOODPECKER
		2		+					48	HORNED LARK
	+			9	8					GRAY JAY
1	14	47	5	17		1		7		BLUE JAY
22	2	214	18	139	17	54	28	211	16	BLACK-BILLED MAGPIE
41	38	26	79	307	17	13	2			COMMON RAVEN
6	3	228	30	199	14	11	7	63		BLACK-CAPPED CHICKADEE
				6	28					BOREAL CHICKADEE
	4	9	1	16	3			123		RED-BREASTED NUTHATCH
		4	2	5	1			15		WHITE-BREASTED NUTHATCH
				2				18		GOLDEN-CROWNED KINGLET
	1	14		2			+	+		AMERICAN ROBIN
	70	2904		6256		105	51	30		BOHEMIAN WAXWING
		20						10		CEDAR WAXWING
		2		1						NORTHERN SHRIKE
							1	46		EUROPEAN STARLING
		1	1	8			1	14		DARK-EYED JUNCO (S-C)
300		391		88		1	13		21	SNOW BUNTING
44	+	100	17	36	2	4	7			PINE GROSBEAK
										PURPLE FINCH
						2		40		HOUSE FINCH
227		102	56	32			3	25	27	COMMON REDPOLL
								3		HOARY REDPOLL
				+				124		PINE SISKIN
45	40	2	8	49	1	2				EVENING GROSBEAK
	85	398	12	327		352	211	1317		HOUSE SPARROW
691	261	4687	255	8585	119	5934	339	7119	220	TOTAL INDIVIDUALS COUNT DAY
13	12	30	18	29	15	23	16	33	9	NO. SPECIES COUNT DAY
13	16	32	19	34	15	23	23	34	14	NO. SPECIES COUNT PERIOD
0	2	5	1	9	3	3	3	31	1	NO. INDIVIDUALS IN TABLES 4 & 5
0	2	3	1	3	1	3	2	9	4	NO. SPECIES IN TABLES 4 & 5

Table 3-9. SPECIES RECORDED FROM MORE THAN NINE LOCALITIES  
(+ = species seen during the count period but not on count day)

SPECIES	LOCALITY & DATE	79. ROUND L. (QV) 20 December 1997	80. SALTCOARS 26 December 1997	81. SK LANDING PP 23 December 1997	82. SASK R. FORKS 20 December 1997	83. SASKATOON 26 December 1997	84. SCOTT 27 December 1997	85. SHAMROCK 25 December 1997	86. SHAUNAVON 04 January 1998	87. SKULL CREEK 26 December 1997	88. SNOWDEN 27 December 1997
CANADA GOOSE						+				30	
MALLARD		6		104		27				15	
COMMON GOLDENEYE						485					
BALD EAGLE		2		+		3				3	
NORTHERN GOSHAWK		1								1	
ROUGH-LEGGED HAWK										1	
GOLDEN EAGLE		2		1					1	1	
MERLIN						6			1	1	
GRAY PARTRIDGE				5		32	22	17	2	20	
RING-NECKED PHEASANT						+				5	
RUFFED GROUSE		+			1	1					6
SHARP-TAILED GROUSE				4		30				59	5
ROCK DOVE		38		2	5	2433	12		3		30
GREAT HORNED OWL		2	1	1		5	2		4	4	
SNOWY OWL				1		1	2		3	3	
DOWNY WOODPECKER		3	4		2	21				6	7
HAIRY WOODPECKER		3	6		1	25			1	7	7
BLACK-BACKED WOODPECKER											
NORTHERN FLICKER (Y-S)						14	+		1	2	
PILEATED WOODPECKER					1						+
HORNED LARK				1				4		20	
GRAY JAY					1						5
BLUE JAY		19	2		3	84	3		8	6	13
BLACK-BILLED MAGPIE		73	15	48	22	822	54	6	18	42	35
COMMON RAVEN		10	9		24	13	1				201
BLACK-CAPPED CHICKADEE		65	25	4	5	450	10			66	67
BOREAL CHICKADEE					5		1				6
RED-BREASTED NUTHATCH		1	1			138	2		3	1	1
WHITE-BREASTED NUTHATCH		6	2			4			1		
GOLDEN-CROWNED KINGLET		3			2	3	1				
AMERICAN ROBIN						4					
BOHEMIAN WAXWING		143	12		1	362	102		2	120	
CEDAR WAXWING						129				103	
NORTHERN SHRIKE		1									
EUROPEAN STARLING						19					+
DARK-EYED JUNCO (S-C)						5				2	
SNOW BUNTING				211	1	36	67		35	80	11
PINE GROSBEAK		2	10		8	62	6		1	26	36
PURPLE FINCH											
HOUSE FINCH						40			8		
COMMON REDPOLL		40	28		25	117	2			25	145
HOARY REDPOLL			4								
PINE SISKIN						6					
EVENING GROSBEAK		8			13						239
HOUSE SPARROW		23	48	82	33	2934	305	58	300	98	
TOTAL INDIVIDUALS COUNT DAY		454	167	469	153	8387	592	85	393	762	815
NO. SPECIES COUNT DAY		24	14	16	18	41	16	4	18	32	17
NO. SPECIES COUNT PERIOD		25	14	18	18	45	17	4	18	32	21
NO. INDIVIDUALS IN TABLES 4 & 5		3	0	5	0	76	0	0	1	15	1
NO. SPECIES IN TABLES 4 & 5		3	0	5	0	12	0	0	1	5	3



Table 3-10. SPECIES RECORDED FROM MORE THAN NINE LOCALITIES  
(+ = species seen during the count period but not on count day)

89. SPALDING 26 December 1997	90. SPINNEY HILL 23 December 1997	91. SPRUCE HOME 31 December 1997	92. SQUAW RAPIDS 02 January 1998	93. ST. LUKE 26 December 1997	94. SWIFT CURRENT 28 December 1997	95. TISDALE 25 December 1997	96. TOGO 26 December 1997	97. TURTLE LAKE 20 December 1997	98. WATSON 04 January 1998	LOCALITY & DATE
			89							CANADA GOOSE
			27		2					MALLARD
			188							COMMON GOLDENEYE
			75							BALD EAGLE
			1							NORTHERN GOSHAWK
			1							ROUGH-LEGGED HAWK
							1			GOLDEN EAGLE
					3					MERLIN
					10					GRAY PARTRIDGE
					1					RING-NECKED PHEASANT
2			4					6		RUFFED GROUSE
			41	1						SHARP-TAILED GROUSE
3				35	106			3	7	ROCK DOVE
	1		1	1						GREAT HORNED OWL
	1				1					SNOWY OWL
	2	2	2	1	1		2	6		DOWNY WOODPECKER
	5	2	4		1	1	2	8		HAIRY WOODPECKER
			1					1		BLACK-BACKED WOODPECKER
					5					NORTHERN FLICKER (Y-S)
			2				1			PILEATED WOODPECKER
					12					HORNED LARK
		1	11					7		GRAY JAY
	8	1	7	1	1			39		BLUE JAY
3	64	1	16	11	60	10	2	45	1	BLACK-BILLED MAGPIE
15	6	15	98	+			3	64	1	COMMON RAVEN
3	33	12	30	10	+	2	14	56	6	BLACK-CAPPED CHICKADEE
			7					16		BOREAL CHICKADEE
	+				74			7		RED-BREASTED NUTHATCH
			2		2		1	12		WHITE-BREASTED NUTHATCH
	1				+					GOLDEN-CROWNED KINGLET
					+					AMERICAN ROBIN
40				50	1	30			+	BOHEMIAN WAXWING
										CEDAR WAXWING
	1						1			NORTHERN SHRIKE
										EUROPEAN STARLING
					4					DARK-EYED JUNCO (S-C)
			2							SNOW BUNTING
	35	13	4	9	10		10	121	6	PINE GROSBEAK
					19					PURPLE FINCH
					1					HOUSE FINCH
	11	22	166	20			35	56		COMMON REDPOLL
			8				6	2		HOARY REDPOLL
					2			5		PINE SISKIN
	25	9	23				13	27		EVENING GROSBEAK
60	4		6	26	1377	15		30	16	HOUSE SPARROW
126	197	78	831	166	1694	58	91	512	38	TOTAL INDIVIDUALS COUNT DAY
7	14	10	31	12	22	5	13	20	7	NO. SPECIES COUNT DAY
7	15	10	31	13	29	5	13	20	8	NO. SPECIES COUNT PERIOD
0	0	0	15	1	1	0	0	1	1	NO. INDIVIDUALS IN TABLES 4 & 5
0	0	0	5	1	5	0	0	1	1	NO. SPECIES IN TABLES 4 & 5

Table 3-11. SPECIES RECORDED FROM MORE THAN NINE LOCALITIES  
(+ = species seen during the count period but not on count day)

SPECIES	LOCALITY & DATE	99. WELDON 21 December 1997	100. WEYBURN 20 December 1997	101. WHITE BEAR 28 December 1997	102. WHITEWOOD 21 December 1997	103. YORKTON 30 December 1997	Number of Counts Count Day	Number of Counts Count Period	Total Individuals Count Day
CANADA GOOSE			2				14	16	56832
MALLARD			8			14	23	23	27895
COMMON GOLDENEYE							13	13	887
BALD EAGLE			2		+		22	29	154
NORTHERN GOSHAWK				1			8	13	9
ROUGH-LEGGED HAWK							12	13	21
GOLDEN EAGLE				1			24	30	44
MERLIN			2			1	16	18	27
GRAY PARTRIDGE			8	58		+	29	38	524
RING-NECKED PHEASANT							14	15	57
RUFFED GROUSE					4	2	43	48	158
SHARP-TAILED GROUSE			9	15	24		40	45	998
ROCK DOVE			125	262	98	261	62	64	7568
GREAT HORNED OWL			4	+	3	1	53	63	127
SNOWY OWL			2	+	2		41	48	127
DOWNY WOODPECKER		2	5		10	3	69	73	278
HAIRY WOODPECKER		2	1		13	3	69	71	287
BLACK-BACKED WOODPECKER							8	10	13
NORTHERN FLICKER (Y-S)			3			1	12	16	61
PILEATED WOODPECKER							11	16	16
HORNED LARK					+		18	22	416
GRAY JAY							28	31	131
BLUE JAY		2			3	5	71	75	703
BLACK-BILLED MAGPIE		1	86	108	92	46	96	96	4985
COMMON RAVEN		2			10	62	65	67	2207
BLACK-CAPPED CHICKADEE		6	6		89	60	87	89	3450
BOREAL CHICKADEE						1	26	26	166
RED-BREASTED NUTHATCH			4		8	11	54	56	705
WHITE-BREASTED NUTHATCH		2	3		4	1	41	42	171
GOLDEN-CROWNED KINGLET			2				12	13	78
AMERICAN ROBIN					+	1	13	20	43
BOHEMIAN WAXWING		37			17	167	47	50	12722
CEDAR WAXWING			2		+		9	11	477
NORTHERN SHRIKE							10	10	14
EUROPEAN STARLING			31	2	18	8	18	19	351
DARK-EYED JUNCO (S-C)			7		1		18	18	152
SNOW BUNTING					+		45	53	4762
PINE GROSBEAK		10	3		13	40	69	70	1274
PURPLE FINCH			1				7	10	53
HOUSE FINCH					2		10	11	139
COMMON REDPOLL			20		306	40	64	65	3052
HOARY REDPOLL					3	4	12	12	39
PINE SISKIN			4		1		17	20	428
EVENING GROSBEAK		15					42	45	2478
HOUSE SPARROW			517	140	1285	297	84	85	22290
TOTAL INDIVIDUALS COUNT DAY		104	861	587	2008	1030			
NO. SPECIES COUNT DAY		12	29	8	24	23			
NO. SPECIES COUNT PERIOD		12	29	11	30	24			
NO. INDIVIDUALS IN TABLES 4 & 5		25	4	0	2	1			
NO. SPECIES IN TABLES 4 & 5		2	4	1	3	1			



Table 4. SPECIES SEEN ON NINE OR FEWER COUNTS

SPECIES	LOCATION AND NUMBER
COMMON LOON	Squaw Rapids, 1
HORNED GREBE	Coronach, 1
WESTERN GREBE	Gardiner Dam, 1
AMERICAN WHITE PELICAN	Fort Qu'appelle, 1; Squaw Rapids, 4
DOUBLE-CRESTED CORMORANT	Squaw Rapids, 1
TUNDRA SWAN	Craven, 1
TRUMPETER SWAN	Round Lake (Qu'appelle Valley), 1
GR. WHITE-FRONTED GOOSE	Coronach, 1
SNOW GOOSE	Coronach, 3; Gardiner Dam, 1
SNOW GOOSE (Blue)	Fort Qu'appelle, +
GREEN-WINGED TEAL	Coronach, 2; Fort Qu'appelle, +; Govenlock, +, Saskatchewan Landing Prov. Park, 1
AMERICAN BLACK DUCK	Coronach, 1
NORTHERN PINTAIL	Coronach, 2; Fife Lake, 1
NORTHERN SHOVELER	Coronach, 1
GADWALL	Coronach, 1; Crooked Lake, 1; Gardiner Dam, 1; Grayson, 2; Round Lake (Qu'appelle Valley), 1; Saskatchewan Landing Prov. Park, 1
AMERICAN WIGEON	Coronach, 1; Estevan, 1; Qu'appelle Valley Dam, 1; Saskatchewan Landing Prov. Park, 1
CANVASBACK	Coronach, 1; Gardiner Dam, 2
REDHEAD	Coronach, 1; Grayson, 2
RING-NECKED DUCK	Saskatoon, 1
GREATER SCAUP	Gardiner Dam, 5
LESSER SCAUP	Beauval, +; Coronach, 5; Estevan, 2; Fort Qu'appelle, +; Gardiner Dam, 7; Govenlock, 1
OLDSQUAW	Saskatoon, 1
BUFFLEHEAD	Coronach, 7; Fife Lake, 1
HOODED MERGANSER	Coronach, 1; Fort Qu'appelle, +
RED-BREASTED MERGANSER	Coronach, 2; Gardiner Dam, 3
COMMON MERGANSER	Coronach, 7; Craven, 1; Fort Qu'appelle, +; Gardiner Dam, 103; Saskatoon, 2; Squaw Rapids, 1; Yorkton, 1
RUDDY DUCK	
TURKEY VULTURE	Kinloch, 1
NORTHERN HARRIER	Fort Walsh, 1; Pike Lake, 1
SHARP-SHINNED HAWK	Saskatoon, +
COOPER'S HAWK	Skull Creek, 1
SWAINSON'S HAWK	Eastend - Consul, 1
RED-TAILED HAWK	Cypress Hills Prov. Park, 1; Fort Qu'appelle, +; Govenlock, 2; Weyburn, 1
HARLAN'S HAWK	Govenlock, 1
AMERICAN KESTREL	Govenlock, 1; Whitewood, 1
GYRFALCON	Brightwater Reservoir, 1; Indian Head, 1; Love 1; Qu'appelle Valley Dam, 1; Saskatchewan Landing Prov. Park, +
PRAIRIE FALCON	Govenlock, 2; Grasslands Nat. Park, 1; Rockglen - Borderland, +; Skull Creek, 1; Swift Current, +; White Bear, +
SPRUCE GROUSE	Love 1
WILLOW PTARMIGAN	Nipawin, +; Snowden, +
SAGE GROUSE	Govenlock, 37
WILD TURKEY	Broadview, 8; Estevan, 3; Estuary, 9; Fort Walsh, 1
AMERICAN COOT	Coronach, 51
KILLDEER	Crooked Lake, +; Grayson, 1
COMMON SNIPE	Fort Walsh, 1; Saskatchewan Landing Prov. Park, 2
HERRING GULL	Gardiner Dam, 4
MOURNING DOVE	Govenlock, 1; Kinloch, +; Skull Creek, 1; St. Luke, 1
WESTERN SCREECH-OWL	Leader South, 1
NORTHERN HAWK-OWL	Prince Albert, 2; Snowden, +
GREAT GRAY OWL	Snowden, 1
SHORT-EARED OWL	Indian Head, 1; Regina, 2; Rockglen - Borderland, +
BOREAL OWL	Anglin Lake, 1
THREE-TOED WOODPECKER	Armit, 1; Duck Lake, 3; Fort Walsh, 1; Good Spirit L., 1; Horseshoe Bend, 1; Kilwinning, 1; Prince Albert Nat. Park, 3
N. FLICKER (RED-SHAFTED)	Regina, 1

Table 4. SPECIES SEEN ON NINE OR FEWER COUNTS (continued)

SPECIES	LOCATION AND NUMBER
AMERICAN CROW	Brightwater Reservoir, 1; Fort Walsh, 1; Kenosee Lake, 1; Moose Mountain, 1; Nipawin, 2; Regina, 4; Saskatoon, 8; Weyburn, 1; Whitewood, 1
MOUNTAIN CHICKADEE	Cypress Hills Prov. Park, 3
BROWN CREEPER	Fort Walsh, 4; Regina, 5; Swift Current. +
TOWNSEND'S SOLITAIRE	Fort Walsh, 1; Indian Head, 1; Kenosee Lake, 1; Moose Jaw, 1; Regina, 1
HERMIT THRUSH	MacDowall, +
VARIED THRUSH	Prince Albert, +; Swift Current. +
ORANGE-CROWNED WARBLER	Saskatoon, +
YELLOW-RUMPED W. (MRYTLE)	Biggar, 1; Regina, 1
NORTHERN CARDINAL	Kamsack, 2
AMERICAN TREE SPARROW	Fort Walsh, 8; Govenlock, 1; Skull Creek, 9
SAVANNAH SPARROW	Gardiner Dam, 2; Rockglen - Borderland, 1
FOX SPARROW	Saskatoon, 1; Turtle Lake, 1
SONG SPARROW	Birch Hills, 1; Fort Walsh, 1; Kenaston, 1
LINCOLN'S SPARROW	Raymore, 1
WHITE-THROATED SPARROW	Fort Qu'appelle, +; Kinloch, 1; Livelong, 1; Moose Jaw, +; Saskatoon, 2; Swift Current. 1
WHITE-CROWNED SPARROW	Fort Walsh, 1
HARRIS' SPARROW	Govenlock, 1; Round Lake (Qu'appelle Valley), 1
DARK-EYED JUNCO (OREGON)	Fort Walsh, 3
LAPLAND LONGSPUR	Coronach, 7; Fife Lake, 1; Fort Qu'appelle, 15; Govenlock, 3; Livelong, 1; Moose Jaw, 1; Rockglen - Borderland, +
RED-WINGED BLACKBIRD	Fort Qu'appelle, +; Fort Walsh, 2; Pike Lake, 1
RUSTY BLACKBIRD	Fort Walsh, 3; Govenlock, +; Kinloch, +; Skull Creek, 3
BREWER'S BLACKBIRD	Biggar, 1; Govenlock, +; Pike Lake, 3; Preeceville, 1; Weyburn, 1
COMMON GRACKLE	Gardiner Dam, 1; Horseshoe Bend, 1; Saskatoon, 1; Watson, 1; Weyburn, 1
GRAY-CROWNED ROSY FINCH	Cypress Hills Prov. Park, 2; Saskatoon, 1; Weldon, 1
RED CROSSBILL	Cypress Hills Prov. Park, 15; Fort Walsh, 149; Saskatoon, 9
WHITE-WINGED CROSSBILL	Armit, 1; Fort Walsh, 26; Kelvington, 6; Kinloch, 9; Prince Albert, 7; Raymore, 2; Regina, 14; Saskatoon, 50; Squaw Rapids, 8; Swift Current. +
AMERICAN GOLDFINCH	Shaunavon, 1; Whitewood, +

Table5 . BIRDS NOT IDENTIFIED TO SPECIES

SPECIES	LOCATION AND NUMBER
BUTEO species	Regina, 1
GULL (White-headed) species	Qu'appelle Valley Dam, 1
WOODPECKER species	Clark's Crossing, 1; Regina, 2
CHICKADEE species	Armit, 1
WAXWING species	Clark's Crossing, 50
REDPOLL species	Assiniboia, 40; Gardiner Dam, 2; Weldon, 24



Table 6. SUMMARY OF NEW OR TYING HIGH COUNTS ESTABLISHED DURING THE 1997 COUNTS (tying counts regular type; new records are in bold/italic)

LOCATION	1997 COUNT	SPECIES	PREVIOUS HIGH	LOCATION AND YEAR
Squaw Rapids	1	COMMON LOON	1	6 counts N. to Grand Centre - Pierceland and Squaw Rapids
Coronach	1	HORNED GREBE	1	Regina (59, 60, 61, 77)
Gardiner Dam	1	WESTERN GREBE	1	Saskatoon (83)
				Regina (56,69), Qu'appelle Dam (90), Gardiner Dam (79, 88)
<i>Squaw Rapids</i>	<b>4</b>	<b>AM. WHITE PELICAN</b>	<b>2</b>	<b>Regina (59), Love (91)</b>
Squaw Rapids	1	DOUBLE-CRESTED COR-MORANT	1	Squaw Rapids (81), Gardiner Dam (87)
<i>Coronach</i>	<b>3</b>	<b>SNOW GOOSE</b>	<b>1</b>	<b>Regina (74, 84), Saskatoon (79)</b>
<i>Fort Qu'appelle</i>	<b>1</b>	<b>BLUE GOOSE</b>	<i>New</i>	
<i>Estevan</i>	<b>27800</b>	<b>CANADA GOOSE</b>	<b>3140</b>	<b>Regina (93)</b>
<i>Coronach</i>	<b>17000</b>	<b>MALLARD</b>	<b>15150</b>	<b>Coronach (94)</b>
Saskatoon	1	RING-NECKED DUCK	1	Crooked Lake (89)
<i>Gardiner Dam</i>	<b>5</b>	<b>GREATER SCAUP</b>	<b>1</b>	<b>Regina (74)</b>
<i>Saskatoon</i>	<b>1</b>	<b>OLDSQUAW</b>	<b>+</b>	<b>Fort Qu'appelle (68)</b>
<i>Coronach</i>	<b>7</b>	<b>BUFFLEHEAD</b>	<b>6</b>	<b>Estevan</b>
Gardiner Dam	3	RED-BREASTED MERG.	3	Gardiner Dam (87)
Skull Creek	1	COOPER'S HAWK	1	10 counts N. to North Battleford
Govenlock	1	HARLAN'S HAWK	1	White Bear (95)
Govenlock, Whitewood	1	AMERICAN KESTREL	1	10 counts N. to Dalmeny
<i>Armit, Kamsack</i>	<b>20</b>	<b>RUFFED GROUSE</b>	<b>17</b>	<b>Battlefords (60)</b>
<i>Coronach</i>	<b>51</b>	<b>AMERICAN COOT</b>	<b>23</b>	<b>Coronach (94)</b>
<i>Leader South</i>	<b>1</b>	<b>WESTERN SCREECH OWL</b>	<i>New</i>	
<i>Regina</i>	<b>36</b>	<b>SNOWY OWL</b>	<b>25</b>	<b>Regina (79)</b>
Anglin Lake	1	BOREAL OWL	1	20 counts S. to Indian Head
<i>Cypress Hills P. P.</i>	<b>3</b>	<b>MOUNTAIN CHICKADEE</b>	<b>1</b>	<b>5 counts N. to Marsden</b>
<i>MacDowall</i>	<b>+</b>	<b>HERMIT THRUSH</b>	<i>New</i>	
<i>Saskatoon</i>	<b>+</b>	<b>ORANGE-CROWNED W.</b>	<i>New</i>	
<i>Biggar, Regina</i>	<b>1</b>	<b>YELLOW-RUMP. W. (Mrytle)</b>	<b>1</b>	<b>Saskatoon (54)</b>
<i>Kamsack</i>	<b>2</b>	<b>NORTHERN CARDINAL</b>	<b>1</b>	<b>Craven (60), Saskatoon (80, 81)</b>
<i>Gardiner Dam</i>	<b>2</b>	<b>SAVANNAH SPARROW</b>	<b>1</b>	<b>Saskatoon (91)</b>
Saskatoon, Turtle Lake	1	FOX SPARROW	1	6 counts N. to Biggar and Saskatoon
Raymore	1	LINCOLN'S SPARROW	1	Broadview (95), Gardiner Dam (96)
Fort Walsh	1	WHITE-CROWNED SPARROW	1	7 counts N. to Saskatoon
<i>Swift Current</i>	<b>19</b>	<b>PURPLE FINCH</b>	<b>18</b>	<b>Kamsack (91)</b>

Table 7. COMPARISON OF THE 1997 POPULATIONS TO 1996 AND AVERAGE PAST YEARS (1992 - 1996) BASED ON PARTY HOURS PER INDIVIDUAL BIRD SEEN

SPECIES	97 VS 96	vs 5yr	SPECIES	97 VS 96	vs 5yr
CANADA GOOSE	29711.4	2582.1	COMMON RAVEN	18.6	20.5
MALLARD	486.0	117.5	BLACK-CAPPED CHICKADEE	-13.4	-0.9
COMMON GOLDENEYE	217.9	-4.1	BOREAL CHICKADEE	27.5	22.6
BALD EAGLE	181.9	93.5	RED-BREASTED NUTHATCH	68.0	38.1
NORTHERN GOSHAWK	-64.8	-4.2	WHITE-BREASTED NUTHATCH	9.8	-1.8
GOLDEN EAGLE	22.1	-8.0	BROWN CREEPER	10.6	10.4
MERLIN	78.7	7.5	GOLDEN-CROWNED KINGLET	6610.1	15.2
PRAIRIE FALCON	14.7	-0.2	AMERICAN ROBIN	-84.4	-2.5
GRAY PARTRIDGE	-82.3	-80.2	BOHEMIAN WAXWING	242.7	109.1
RING-NECKED PHEASANT	-74.2	-9.1	CEDAR WAXWING	1.3	-49.5
SPRUCE GROUSE	-95.2	-32.4	NORTHERN SHRIKE	-45.3	-59.2
RUFFED GROUSE	65.8	38.1	EUROPEAN STARLING	-28.1	-35.3
SHARP-TAILED GROUSE	-35.0	-17.2	AMERICAN TREE SPARROW	93.6	-5.6
ROCK DOVE	39.2	10.5	DARK-EYED JUNCO	18.9	-33.3
GREAT HORNED OWL	40.1	14.1	LAPLAND LONGSPUR	-64.0	-99.2
SNOWY OWL	45.7	24.0	SNOW BUNTING	-73.7	-96.0
SHORT-EARED OWL	-78.5	-1.0	RED-WINGED BLACKBIRD	-83.9	-115.9
DOWNY WOODDPECKER	-21.1	-12.2	RUSTY BLACKBIRD	-83.9	-107.2
HAIRY WOODPECKER	-21.6	-21.4	PINE GROSBEAK	-43.3	-17.7
THREE-TOED WOODPECKER	-27.2	1.0	RED CROSSBILL	-20.4	839.2
NORTHERN FLICKER	249.8	93.8	WHITE-WINGED CROSSBILL	-70.6	-92.4
PILEATED WOODPECKER	14.7	-16.0	COMMON REDPOLL	-2.4	-33.9
HORNED LARK	-58.2	-93.4	HOARY REDPOLL	59.8	-53.8
GRAY JAY	34.2	-0.6	PINE SISKIN	338.3	366.7
BLUE JAY	10.6	24.3	EVENING GROSBEAK	66.5	22.7
BLACK-BILLED MAGPIE	3.4	21.5	HOUSE SPARROW	37.9	14.3



# MISSED OPPORTUNITIES, 1944-1953: WHOOPING CRANE NEST SITES IN WOOD BUFFALO PARK

C. STUART HOUSTON, 863 University Drive, Saskatoon, SK S7N 0J8

The last incontrovertible nest records of the Whooping Crane in southern Saskatchewan were from Kiyiu Lake, north of Netherhill, in 1922 and from Luck Lake in 1929.<sup>3</sup> For the next 25 years no one knew where the small number of survivors (15 in 1941), were breeding.<sup>3</sup> Extensive searches for the then-unknown nest sites of the Whooping Crane took place in 1945 by Fred Bard of the Saskatchewan Museum of Natural History and Robert H. Smith of the U.S. Fish and Wildlife Service (USF&WS), in 1946 by O.S. Pettingill of Carleton College, Minnesota, Robert H. Smith, Arthur S. Hawkins and Lyle Sows of U.S. Fish and Wildlife Service and Terris Moore of the New England Museum of Natural History, and in 1947 by Lawrence H. Walkinshaw and Walter Tholen of Battle Creek, Michigan, at their own expense, and by Robert P. Allen of the National Audubon Society (NAS) and Bob Smith of USF&WS. On 25 June 1947, the last day of their search, we know now in retrospect that only a heavy rain squall prevented Smith and Allen from finding nesting cranes as they flew parallel to the 60th parallel in the Northwest Territories, over the Klewi and Sass Rivers en route from Great Slave and Buffalo Lakes to Fort Smith. In 1948, Smith and Allen covered the Arctic coast from Point Barrow, Alaska to Bathurst Inlet, concentrating on the deltas of the Mackenzie and Anderson Rivers, and found nothing. Sur-

veys were suspended in 1949, 1950 and 1951. In 1952, Smith found "the strongest clue" yet, two cranes north of Great Slave Lake; yet no cranes were there on a return visit in 1953.<sup>2</sup> Finally, at 5 p.m. on 30 June 1954, G.M. Wilson radioed from a helicopter over Wood Buffalo Park to William A. Fuller in Fort Smith, then the capital of the Northwest Territories, with news of what was the first Whooping Crane nest to be seen in 25 years.<sup>2</sup>

Using that perfect instrument, the retrospectoscope, beloved by radiologists and others, it is time to give more credence to the Whooping Crane observations of John C. Nesbitt, a bush pilot and prospector responsible for the discovery of three uranium mines. In October 1983, John C. Nesbitt's son, Archie J. Nesbitt, wrote me from Calgary. "Tragically," he said, the National Audubon Society "did not involve father" in the search for the Whooping Crane. Instead, Archie suggested, the NAS "did not know or could not understand the North ... they wanted to have all the recognition and publicity." Archie enclosed a copy of his bush-pilot father's autobiography, published just before his death in 1979.<sup>4</sup> The passage of greatest interest follows:

I was flying over the tree tops in the area of the Wood Buffalo Park, north of the Salt River, when I spotted some large white

birds with a lot of red around their beaks, more so on what I presumed to be males. There were twelve: they did not fly but only raised their wings showing a black wing top [=tip]. They had lace-like feathers on their tail which seemed to droop when standing and they were indeed of great height. I immediately called to see Des Boggs that evening, but he could not fathom any such bird in that area. I was to see them on many occasions, in the same area, and also, once north of Fort McMurray, but they did not stay there, and only nested in the Wood Buffalo Park; this I was certain. I once showed them to Gilbert Labine and some of his friends on a tour north. This was 1944 and it would be some time before I would really find out the name of this most beautiful bird. I had mentioned it to several biologists, and they Fig.d I had mistaken them for pelicans. I told them that they were not pelicans and also pelicans had never been seen north [and west] of Pelican Rapids on the Slave River at Fort Smith.

On the previous page of the autobiography Nesbitt told of Desmond Boggs,

a consulting geologist stationed at the Wells [Norman Wells], who had spent over twenty years in South America ... Desmond Boggs was a most professional ornithologist [ornithologist] as well and had sent to Toronto some very rare bird specimens from South America ... He had a dresser drawer in his room with over fifty of these north birds, all skinned, stuffed and tagged as to adult, or juvenile, what was in its crop and where it had been taken. These were all for the museum in Toronto. Few people

ever knew that he had this great knowledge. I was probably the only one.

Only in 1947 did Nesbitt, now a pilot with Eldorado Mining and Exploration, positively identify the large white birds with black wing tips. On 4 August 1947 he wrote to Dr. Gustave A. Swanson of the USF&WS, telling of observations of two (not 12) Whooping Cranes in 1944.<sup>1</sup> Robert Porter Allen's reply of 3 September 1947, after receipt of the forwarded letter (and the same day a memorandum from J. Clark Salyer of the USFWS reported a telephone call from Mr. Beasley Martin with regard to the same sighting), is reproduced in Nesbitt's book. Allen acknowledged receipt of a map "showing the general area where these birds were seen. ... in early July 1944."<sup>4</sup> Failing to recognize that Nesbitt's July 1944 record was a probable breeding site record, Allen's published reply to Nesbitt shows that in spite of the new information and map he was sticking to his plan to search the Mackenzie and Anderson River deltas in 1948.

On 19 August 1948 Nesbitt sent a radiogram to the NAS, telling of another sighting of Whooping Cranes that day in Alberta, namely the Archer Lake region 30 miles south of Lake Athabasca. Nesbitt's 1944 and 1948 records were listed in R.P. Allen's monograph, *The Whooping Crane*, in 1952. The locality of the 1944 observation was somewhat misrepresented and given in the monograph as the nearest settlement, "Pine Point" [85 km east of Hay River] rather than as the Klewi and Sass Rivers in Wood Buffalo Park,<sup>1</sup> 80 to 100 km to the south of Pine Point.

I did a little investigation. Ross D. James, Associate Curator of Ornithology at the Royal Ontario Museum



(ROM), replied to me on 17 November 1983, to say that Desmond Boggs had indeed sent to ROM "a considerable collection of birds from South America, also a considerable number from Alberta and a few from N.W.T. ... a careful observer and recorder." Boggs' brief notes in 1942 and his diaries, 1950-1962, contained no mention of Whooping Cranes. More important, I wrote the NAS in New York and they in turn forwarded my query to Alexander Sprunt IV at their office in Tavernier, Florida, where Robert Porter Allen's files were stored. Sprunt promised to reply after he had an opportunity to look for the Nesbitt correspondence. I preferred not to publish this note without having access to the original letter from Nesbitt to Swanson, and the accompanying map. Several reminders to Sprunt over the intervening years have failed to achieve a response.

It has long been evident that the rain squall on 30 June 1947 delayed location of the nest grounds for seven years. We now know that if John C. Nesbitt's observations and map had received the attention they deserved, the nesting grounds might have been discovered the following year, in 1948.

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2. ——. 1956. A report on the Whooping Crane's Northern breeding grounds. Nat. Audubon Society, New York.
3. HJERTAAS, D. 1994. Summer and breeding records of the Whooping Crane in Saskatchewan. *Blue Jay* 52:99-115.
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*Juvenile Long-billed Marsh Wren*

W.E. Rensud



# WHOOPING CRANES NESTING IN ALBERTA

BRIAN JOHNS, Canadian Wildlife Service, 115 Perimeter Road, Saskatoon, SK S7N 0X4

On an early spring day in 1977 Ernie Kuyt, of the Canadian Wildlife Service, discovered the last Whooping Crane nest of the season. This "last nest" would prove to be the first nest discovered in Alberta in 63 years.<sup>4</sup> Twenty years later this pair's Composite Nesting Area (CNA)(the CNA incorporates the nesting sites of a particular pair and approximates the territory the pair uses during the raising of young)<sup>5</sup> is still occupied by a pair of unbanded cranes. Being unbanded, it is not possible to tell if the cranes occupying the territory today are the original pair or if any mate changes have taken place or whether they are entirely new birds. The Alberta breeding area has expanded both west and south of the original site and in 1997 contained eight breeding pairs (Fig. 1).<sup>3</sup> Highlights of the breeding history of these Alberta cranes are:

A single nesting pair has bred in the territory of the original nesting pair for 20 of the last 21 years, skipping only 1980. This territory has been designated as CNA A-1. The cranes breeding here have produced seven offspring that have survived long enough to arrive on the wintering grounds at the Aransas National Wildlife Refuge on the Texas gulf coast.

During 1997 this pair's nest (2/97) was discovered on 7 May with two eggs. The pair had one chick and one egg on the morning of 6 June. They were observed again on June 16 with a single chick and were last seen on 11 August with a single chick. It is unknown whether they have safely arrived on the wintering grounds.

In 1988 a second pair took up residence in Alberta (CNA A-2). Both birds were banded. The female (banded Blue White spiral-Blue White spiral) was shot in Texas in January 1989 after successfully raising a banded chick on their first nesting attempt. The male (blue/blue-Yellow) repaired with another banded bird (Yellow-Red) and nested in 1990. The male disappeared during the winter of 1992-93 and the female was seen with an unbanded bird that winter and the following nesting season. There was no nest in 1994. In 1995 the female was observed with a new mate banded Yellow-Yellow/black/Yellow (see below). Nest 15/97 was discovered 16 May and had hatched two chicks by 9 June. One chick was missing the morning of 25 June. The pair with its remaining chick was last seen in Wood Buffalo National Park on 11 August. The family group was observed on the wintering grounds on 6 November with its single chick.

In 1990 a pair of banded birds (male banded Yellow-Yellow/black/Yellow and female banded White-Yellow/black/Yellow) nested together, but then separated and nested elsewhere with different mates in following years (Yellow-Yellow/black/Yellow moves to CNA A-2 in 1995).

In 1992 a pair of unbanded cranes nested in CNA A-4. This pair hatched a chick on their first two breeding attempts, failed to show up on their territory in 1994 and then a pair of unbanded cranes has nested unsuccessfully each year since. In 1997 this pair's nest (4/97) was discovered on 7 May. The nest was not



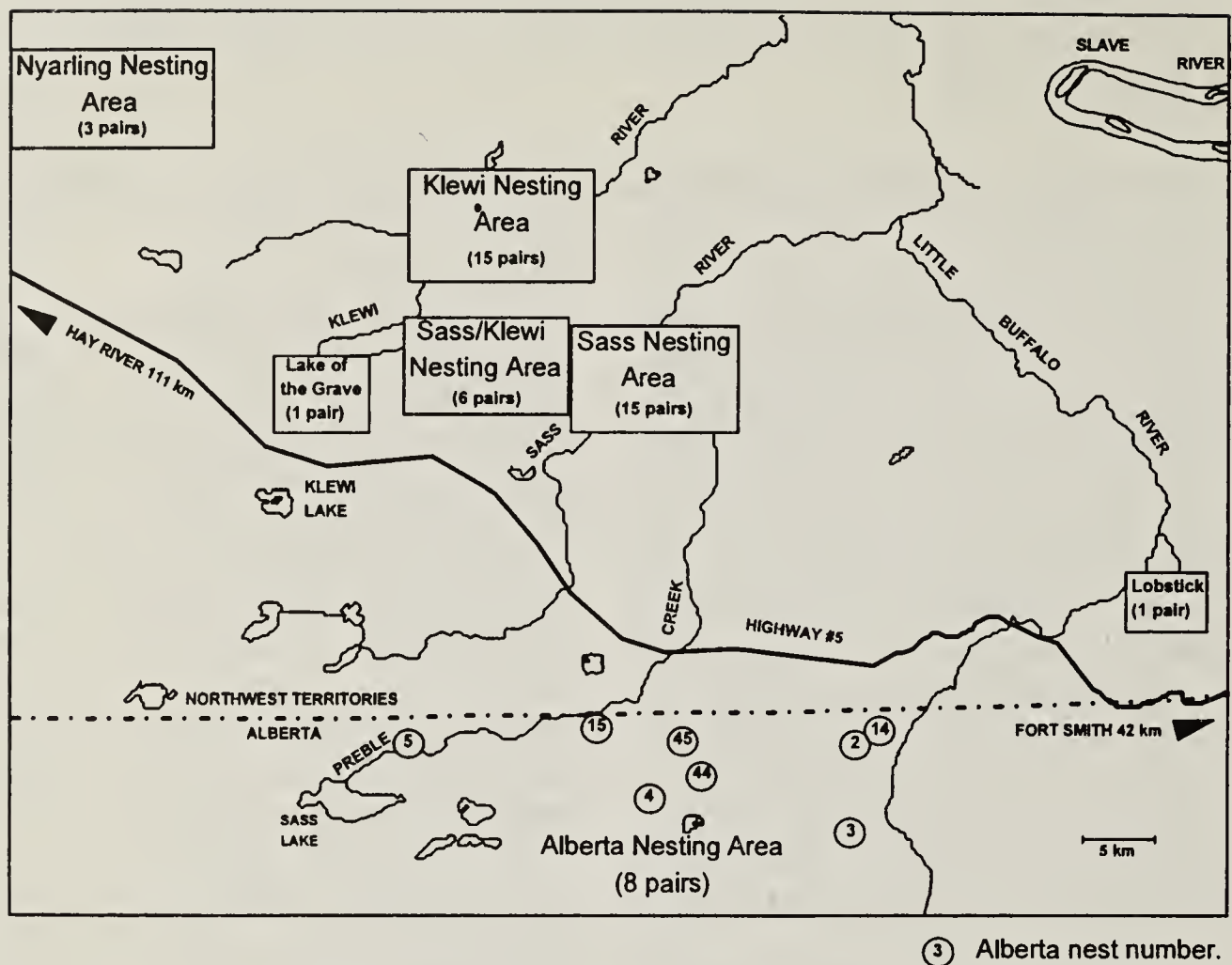


Figure 1. Whooping Crane nesting areas, Wood Buffalo National Park, 1997.

rechecked until 23 May when neither the pair nor their nest could be relocated. The pair was not seen again during the remainder of the summer.

Beginning in 1993 a new pair began nesting (CNA A-5) south of the original Alberta pair. This pair (male banded Green/white/Green-Yellow/black/Yellow and an unbanded female) has never brought a chick to Aransas, their chicks have usually been lost shortly after hatching. In 1997 this pair, nesting at nest 3/97, hatched two chicks between the mornings of 4 and 6 June. One of the chicks went missing on 13 June and the remaining chick was last seen in Wood Buffalo National Park 16 August with its parents. The adults were seen in North Dakota on 14 October without a chick and arrived on the wintering grounds alone in late October.

A new pair (male Yellow/black/Yellow-Yellow/black/Yellow and fe-

male Green-Yellow/black/Yellow) was discovered in 1993 along Preble Creek, west of the traditional nesting area. They skipped the 1994 nesting season but have nested each year since (CNA A-6). Their 1997 nest (5/97) was discovered 7 May and hatched two chicks by 3 June. One of the chicks went missing between the evening of 10 June and the morning of 11 June. The pair was seen with a single chick on 11 August but when they arrived on the wintering grounds on 25 November, they were without the chick.

In 1995 a pair of unbanded cranes established a territory adjacent to the original CNA A-1 and have nested within 425-450 metres of the original pair each year since. This new territory has been designated as CNA A-7. In 1997 the pair nested at nest 14/97. The nest contained two eggs and at least one chick was hatched. The pair with its single

chick was last observed on 11 August. Being unbanded, the specific wintering site of these cranes hasn't been determined yet and it is not known if their chick survived.

Two additional pairs of unbanded birds nested for the first time in 1997 at nests 44/97 and 45/97. Nest 44/97 hatched two chicks between 2 and 4 June and lost one between the mornings of 13 and 15 June. The remaining chick was last seen 24 August. Nest 45/97 was discovered 2 June and the cranes were still incubating 2 July. The nest was abandoned on 4 July and the eggs were predated by the time they were collected on 9 July. Being new nesting pairs the CNA numbers have yet to be designated for nests 44/97 and 45/97. Wintering areas for these two pairs are also not yet determined so it is unknown whether the young from nest 44/97 safely arrived on the wintering grounds.

As noted above, pairs from CNA's A-2, A-4 and A-6 did not nest in 1994. There were also 13 other experienced breeding pairs that failed to nest in 1994.<sup>2</sup> Information available from studies conducted on the Texas wintering grounds<sup>1,6</sup> indicates that blue crab numbers, the principal winter food of the cranes, were very low throughout most of the winter of 1993/94. The cranes exhibited a net energy loss<sup>1</sup> and many were likely in poor physical condition prior to the breeding season. This was reflected during the spring migration, which was very erratic with some birds leaving Aransas earlier than usual while others left later than normal, three cranes eventually summered at Aransas.<sup>7</sup> Spring arrivals to the breeding grounds in Wood Buffalo National Park that year were also erratic. Several breeding pairs arrived a week or more later than usual with one pair arriving three weeks later than expected.<sup>2</sup>

Nesting habitat in the Alberta portion of Wood Buffalo National Park appears adequate to support additional breeding pairs<sup>4</sup> as evidenced by the expansion of Whooping Cranes into this important new breeding area. However, continued expansion of the breeding grounds may be regulated by conditions on the wintering area 4000 km to the south.

I would like to thank E. Kuyt for introducing me to the Whooping Crane breeding area, Doug Bergeson and other current and past staff from Wood Buffalo National Park for their cooperation and Big River Air Ltd. of Fort Smith.

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# THE ORIOLE RETURNS

PHYLLIS BORDASS, Box 313, Fort Qu'Appelle, SK S0G 1S0

On 19 May, the first oriole returns. I immediately filled the feeder and hung it out on a nearby tree. Soon there was one male and four females. The male dipped at the nectar a bit, but it seemed as though the females didn't know what it was. Then I remembered what Al Smith at the Last Mountain Bird Observatory said. He told us orioles like slices of orange. I cut one into slices and tacked it to the tree. It didn't take them long to find it and demolish all slices. The nectar feeder was ignored. I cut another orange and expanded the station to two trees. Now there were four females and four males, all squabbling over the oranges. I put more slices on two trees at the front by the street and as I replaced the slices the orioles dropped the rinds on the ground at the foot of the tree. By late afternoon, six oranges later, there were fourteen orioles flashing around. What a fantastic sight! At the same time the backyard was moving with about ten male goldfinches, and some females, a flock of Pine Siskins, all at the niger feeder. There were four Rose-breasted Grosbeaks,

two males and two females at the sunflower seeds.

On Saturday, 24 May, at 8:00 a.m. there was a male Western Tanager on the tree. I immediately phoned Lorne Rowell, and Ron Hooper. Lorne, having the shorter distance, made it in time to see it, but by the time Ron got here the bird had disappeared and we didn't see it again. Ron extracted a promise from me that if I saw it again, I was to phone him. That same evening there was another bird at the oranges. I was sure it was a female tanager, but it wasn't yellow as illustrated in the field guides. Rather, it was a muted olive and grey but had the structure of the tanager. The orioles kept chasing it away. Sunday morning, 25 May, 6:30 a.m. it was there again, so I dutifully phoned Ron. When he got here he confirmed it as a female tanager. This is only the second record according to Manley Callin's book for southern Saskatchewan.

It stayed around for three or four days. By then most of the orioles had moved on to continue their trip to their destinations.



Estimates indicate an American Kestrel eats almost 300 mice a year.

A hawk's eye has 7.5 times as many visual cells as a human.

The peregrine's may prey was the Passenger Pigeon; when the pigeon became extinct, the Peregrine population dropped too.

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# MAMMALS

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## SASKATCHEWAN CHRISTMAS MAMMAL COUNTS - 1997

*Compiled by* WAYNE C. HARRIS, Saskatchewan Environment and Resource Management, 350 Cheadle Street West, Swift Current, Saskatchewan. S9H 4G3

The number of mammal counts conducted this year was 96, up from the 82 last year, 12 more than the record set in 1994. The number of species recorded was 39, the same as last year. The average number of species per count (6.67) was below the long-term average.

Weather was the mildest we have recorded on mammal counts with the temperature approaching or exceeding the freezing mark on most days. The lack of snow for most localities during the count meant that animals remained dispersed and tracks were hard to find. No new species were reported. The only species found this year which are irregularly reported were Bobcats at both Cypress Hills counts and Big River. The American Marten at Prince Albert National Park is also not regularly reported.

The most commonly reported species was Coyote, whose numbers appear to be up. White-tailed deer populations, last year's most frequently reported species, dropped dramatically after last year's hard winter.

For weather, coverage and participants please refer to the Christmas Bird Count found elsewhere in this issue. Numbers appearing before the count location name in the tables refer to the location of the count on the map included with the bird count. In the tables, a numeral alone shows that the mammals were seen, while a letter following the number means that the number was inferred by the means

defined below. A letter alone means that the species was present but estimating the numbers was impossible or that no attempt was made to do so.

**T** = tracks

**L** = active lodge or hut

**D** = dead animal found

**d** = fresh diggings found

**S** = smell or odour

**H** = heard

**+** = present during the count period (December 19 to January 4) but not found on count day.



Table 1-1. SASKATCHEWAN CHRISTMAS MAMMAL COUNTS - 1997

SPECIES	LOCALITY & DATE	1. ANGLIN LAKE 26 December 1997	3. ARMIT 03 January 1998	4. ASSINIBOIA 04 January 1998	5. BANGOR 21 December 1997	6. BEAUVAL 04 January 1998	7. BIGGAR 24 December 1997	8. BIG RIVER 27 December 1997	9. BIRCH HILLS 30 December 1997	10. BRIGHTWATER 20 December 1997
SHREW species										
EASTERN COTTONTAIL										
NUTTALL'S COTTONTAIL										
SNOWSHOE HARE			7T	6	5	20T	1T	T	13T	
WHITE-TAILED JACKRABBIT				7						
RICHARDSON'S GR. SQUIRREL				1						
BLACK-TAILED PRAIRIE DOG										
GREY SQUIRREL										
FOX SQUIRREL										
RED SQUIRREL		5T	14;4T			20H		3	1;2T	
NORTHERN FLYING SQUIRREL										
SQUIRREL species										
BEAVER						10L				
DEER MOUSE						1T				
GAPPER'S RED-BACKED VOLE										
MUSKRAT						50L				
MEADOW VOLE						T3			1	
VOLE species							3T			
MOUSE species		T	1T		2			T	5T	
NORWAY RAT										
HOUSE MOUSE										
PORCUPINE					1		1			
COYOTE		1H	2T	16	4	1T	1T		5T	3
WOLF		1H	1;2T			+				
RED FOX			2T	2	1	1T	1T			
RACCOON										
AMERICAN MARTEN										
FISHER										
ERMINE									1;3T	
LONG-TAILED WEASEL									3T	
LEAST WEASEL			1T		1				3T	
WEASEL species			3T				1T			
MINK										
BADGER				1						
STRIPED SKUNK				1	1				1T	
RIVER OTTER						2T				
BOBCAT								T		
LYNX										
MULE DEER										
WHITE-TAILED DEER			2;44T	24	4	3T	9		4T	
DEER species		T								1
MOOSE			4T			1T				
ELK			8T							
PRONGHORN										
TOTAL SPECIES		5	10	8	8	12	7	4	10	2

Table 1-2. SASKATCHEWAN CHRISTMAS MAMMAL COUNTS - 1997 (continued)

SPECIES	LOCALITY & DATE	11. BROADVIEW 27 December 1997	12. BROMHEAD 31 December 1997	13. CABRI 25 December 1997	15. CLARK'S XING 20 December 1997	16. CORONACH 24 December 1997	17. CRAVEN 20 December 1997	18. CROOKED LAKE 22 December 1997	19. CROOKED RIVER 02 January 1998	20. CYPRESS HILLS PP 30 December 1997
SHREW species										
EASTERN COTTONTAIL										
NUTTALL'S COTTONTAIL										4T
SNOWSHOE HARE	4T				2;1T		1	3		
WHITE-TAILED JACKRABBIT										1T
RICHARDSON'S GR. SQUIRREL										
BLACK-TAILED PRAIRIE DOG										
GREY SQUIRREL							3			
FOX SQUIRREL	1						3			
RED SQUIRREL	1;4H						2	9	+	40
NORTHERN FLYING SQUIRREL										
SQUIRREL species										
BEAVER								2L		3L
DEER MOUSE										2T
GAPPER'S RED-BACKED VOLE										
MUSKRAT						1;21L	5	8		
MEADOW VOLE					1		1			
VOLE species										
MOUSE species	1T								+	
NORWAY RAT										
HOUSE MOUSE										3T
PORCUPINE			1D			2T		1D		3T
COYOTE	4T			1T	3	1	2	2		3T
WOLF										
RED FOX										
RACCOON								1D		
AMERICAN MARTEN										
FISHER										
ERMINE										
LONG-TAILED WEASEL							1			
LEAST WEASEL										
WEASEL species					1					
MINK					1T		1			
BADGER			1d		1D					
STRIPED SKUNK	1T									
RIVER OTTER										
BOBCAT										1
LYNX										
MULE DEER						3	3			15
WHITE-TAILED DEER	4;9T	30			10;2T		5	3		2
DEER species										
MOOSE	4T									4;6T
ELK										20
PRONGHORN			11							
TOTAL SPECIES	8	4	1	7	4	11	8	2	13	



Table 1-3. SASKATCHEWAN CHRISTMAS MAMMAL COUNTS - 1997 (continued)

22. DUCK LAKE 28 December 1997	23. DUVAL 28 December 1997	24. EASTEND 21 December 1997	25. EASTEND-CONSUL 31 December 1997	26. EMMA LAKE 30 December 1997	27. ENDEAVOUR 20 December 1997	28. ESTEVAN 27 December 1997	29. ESTUARY N. 04 January 1998	30. FENTON 29 December 1997	LOCALITY & DATE  SPECIES
									SHREW species
									EASTERN COTTONTAIL
									NUTTALL'S COTTONTAIL
	1T	2			1			3;2T	SNOWSHOE HARE
	1T								WHITE-TAILED JACKRABBIT
									RICHARDSON'S GR. SQUIRREL
									BLACK-TAILED PRAIRIE DOG
									GREY SQUIRREL
						7			FOX SQUIRREL
11				2	3			2H;3T	RED SQUIRREL
				+					NORTHERN FLYING SQUIRREL
									SQUIRREL species
						1L			BEAVER
					1				DEER MOUSE
									GAPPER'S RED-BACKED VOLE
	4L					17L			MUSKRAT
1					2			5	MEADOW VOLE
									VOLE species
	3T							4	MOUSE species
									NORWAY RAT
									HOUSE MOUSE
		1				4T			PORCUPINE
1	2T	2	6		1T		2	6;2T	COYOTE
									WOLF
1	4T		2			1T			RED FOX
	1T	1							RACCOON
									AMERICAN MARTEN
									FISHER
									ERMINE
									LONG-TAILED WEASEL
	1								LEAST WEASEL
									WEASEL species
									MINK
									BADGER
	3T	2							STRIPED SKUNK
									RIVER OTTER
									BOBCAT
									LYNX
	2	7	4				2		MULE DEER
	6	6		+	6T	11	2	1T	WHITE-TAILED DEER
					+		+		DEER species
									MOOSE
									ELK
			4						PRONGHORN
4	11	7	4	3	7	6	4	6	TOTAL SPECIES

Table 1-4. SASKATCHEWAN CHRISTMAS MAMMAL COUNTS - 1997 (continued)

SPECIES	LOCALITY & DATE	31. FIFE LAKE 27 December 1997	32. FT. QU'APPELLE 19 December 1997	33. FORT WALSH 20 December 1997	34. GARDINER DAM 22 December 1997	35. GOOD SPIRIT L. 23 December 1997	36. GOVENLOCK 21 December 1997	37. GRASSLANDS NP 19 December 1997	38. GRAYSON 26 December 1997	39. HARRIS 29 December 1997	40. HEPBURN 31 December 1997
SHREW species											
EASTERN COTTONTAIL											
NUTTALL'S COTTONTAIL				2	2		1				
SNOWSHOE HARE			5	2T	1	3T	2;2T				
WHITE-TAILED JACKRABBIT			+	1	2					2	
RICHARDSON'S GR. SQUIRREL											
BLACK-TAILED PRAIRIE DOG								10			
GREY SQUIRREL											
FOX SQUIRREL											
RED SQUIRREL			13	44		2					
NORTHERN FLYING SQUIRREL											
SQUIRREL species											
BEAVER			+	2L		1L	1L		2		
DEER MOUSE			+	25T			1T				
GAPPERS RED-BACKED VOLE											
MUSKRAT		2	6			17L	1L		4		
MEADOW VOLE			+								
VOLE species				5T			1T			3T	
MOUSE species											
NORWAY RAT			+								
HOUSE MOUSE			+								
PORCUPINE			1	1T		2					
COYOTE		2	+	15	3	3	2;1T	9	3	1	
WOLF											
RED FOX				1	1T		2			1T	
RACCOON						1T	1T				
AMERICAN MARTEN											
FISHER											
ERMINE					1	1T				1	
LONG-TAILED WEASEL			+								
LEAST WEASEL				1T		1T					
WEASEL species							1T				
MINK			4	1T		3T			2		
BADGER							1				
STRIPED SKUNK			1						1		
RIVER OTTER											
BOBCAT				1T							
LYNX											
MULE DEER			+	10	102		42	8		4	
WHITE-TAILED DEER			1	67	29	9T	11	58	4	10T	1
DEER species							5T				
MOOSE				1							
ELK				3							
PRONGHORN							411	164			
TOTAL SPECIES		2	16	17	8	11	14	5	6	7	1



Table 1-5. SASKATCHEWAN CHRISTMAS MAMMAL COUNTS - 1997 (continued)

41. HOLBIEN 27 December 1997	42. HORSESHOE BEND 30 December 1997	43. HUMBOLDT 27 December 1997	44. INDIAN HEAD 03 January 1998	45. KAMSACK 04 January 1998	46. KELVINGTON 30 December 1997	47. KENASTON 29 December 1997	48. KENOSEE LAKE 26 December 1997	49. KILWINNING 20 December 1997	50. KINLOCH 23 December 1997	LOCALITY & DATE	SPECIES
						+					SHREW species
			20;10T								EASTERN COTTONTAIL
											NUTTALL'S COTTONTAIL
		10	10	4	6T	1			16T		SNOWSHOE HARE
		1	2	2	4T	+					WHITE-TAILED JACKRABBIT
											RICHARDSON'S GR. SQUIRREL
											BLACK-TAILED PRAIRIE DOG
											GREY SQUIRREL
											FOX SQUIRREL
1	2		16				2	4	3		RED SQUIRREL
											NORTHERN FLYING SQUIRREL
											SQUIRREL species
				L		+			3L		BEAVER
						+					DEER MOUSE
											GAPPER'S RED-BACKED VOLE
				L	1T	+			5L		MUSKRAT
						+			8T		MEADOW VOLE
											VOLE species
					6T						MOUSE species
						T					NORWAY RAT
											HOUSE MOUSE
		1	2	3		T	1				PORCUPINE
		1	27;4T	8	2T	+	+		7T		COYOTE
				2					1T		WOLF
	1		4;7T	2	2T	+		1			RED FOX
											RACCOON
											AMERICAN MARTEN
											FISHER
									3T		ERMINE
			7;1T		1T	T					LONG-TAILED WEASEL
											LEAST WEASEL
											WEASEL species
			1;1T	1							MINK
											BADGER
		1S									STRIPED SKUNK
											RIVER OTTER
											BOBCAT
											LYNX
		2T	8;9T	28	8T	8	6		3		MULE DEER
											WHITE-TAILED DEER
											DEER species
				2					3T		MOOSE
				T					30T		ELK
											PRONGHORN
1	2	6	10	12	8	13	4	2	11		TOTAL SPECIES

Table 1-6. SASKATCHEWAN CHRISTMAS MAMMAL COUNTS - 1997 (continued)

SPECIES	LOCALITY & DATE	51. KUTAWAGAN L. 28 December 1997	52. KYLE 24 December 1997	53. LA RONGE 26 December 1997	54. LAST MT. L.N.W.A 26 December 1997	55. LEADER (North) 30 December 1997	56. LEADER (South) 04 January 1998	58. LOVE - TORCH R. 30 December 1997	59. LUSELAND 02 January 1998	60. MACDOWALL 03 January 1998	61. MARYFIELD 23 December 1997
SHREW species											
EASTERN COTTONTAIL											
NUTTALL'S COTTONTAIL						3					
SNOWSHOE HARE				10T						2T	6
WHITE-TAILED JACKRABBIT	1T					2			2	1T	2
RICHARDSON'S GR. SQUIRREL											
BLACK-TAILED PRAIRIE DOG											
GREY SQUIRREL											
FOX SQUIRREL											
RED SQUIRREL				3				1		2	
NORTHERN FLYING SQUIRREL											
SQUIRREL species											
BEAVER					1L					6L	+
DEER MOUSE						1					
GAPPERS RED-BACKED VOLE											
MUSKRAT	23L			1	5					50L	3L
MEADOW VOLE					1						
VOLE species				18T						2T	
MOUSE species						2					2T
NORWAY RAT											
HOUSE MOUSE											
PORCUPINE	1				3T	1	1		1	1T	+
COYOTE	3	1			1	4	1		1	2	3
WOLF								3		1T	
RED FOX				2T						+	1
RACCOON										+	
AMERICAN MARTEN											
FISHER											
ERMINE				5T							
LONG-TAILED WEASEL											
LEAST WEASEL										2T	
WEASEL species									1T		1T
MINK				2T							
BADGER					1d						
STRIPED SKUNK										1T	5
RIVER OTTER										1T	
BOBCAT											
LYNX											
MULE DEER						4	23		2		
WHITE-TAILED DEER	2				5	10		11		4;30T	13
DEER species											
MOOSE											
ELK											
PRONGHORN											
TOTAL SPECIES		5	1	7	7	7	3	3	5	15	11



Table 1-7. SASKATCHEWAN CHRISTMAS MAMMAL COUNTS - 1997 (continued)

62. MAYVIEW 21 December 1997	63. MEADOW LAKE 26 December 1997	65. MELVILLE 22 December 1997	66. MISSINUIPE 29 December 1997	67. MOOSE JAW 26 December 1997	68. MOOSE MOUNTAIN 19 December 1997	69. NESBIT FOREST W. 01 January 1998	70. NIPAWIN 30 December 1997	71. PIKE LAKE 03 January 1998	72. PREECEVILLE 21 December 1997	LOCALITY & DATE	SPECIES
											SHREW species
											EASTERN COTTONTAIL
											NUTTALL'S COTTONTAIL
	1							20T	4T		SNOWSHOE HARE
		1T		4				4T			WHITE-TAILED JACKRABBIT
											RICHARDSON'S GR. SQUIRREL
											BLACK-TAILED PRAIRIE DOG
											GREY SQUIRREL
				50							FOX SQUIRREL
2	2	4			11		2	5;1T	3		RED SQUIRREL
											NORTHERN FLYING SQUIRREL
											SQUIRREL species
											BEAVER
											DEER MOUSE
											GAPPER'S RED-BACKED VOLE
		1	12L	1							MUSKRAT
											MEADOW VOLE
								1			VOLE species
								3T			MOUSE species
											NORWAY RAT
											HOUSE MOUSE
											PORCUPINE
		+	+		1		1	3;3T	T		COYOTE
			+								WOLF
		+						1T			RED FOX
											RACCOON
											AMERICAN MARTEN
											FISHER
											ERMINE
											LONG-TAILED WEASEL
											LEAST WEASEL
		+									WEASEL species
											MINK
											BADGER
											STRIPED SKUNK
											RIVER OTTER
											BOBCAT
											LYNX
											MULE DEER
2		2		5		+		13T	2		WHITE-TAILED DEER
								56T			DEER species
											MOOSE
											ELK
											PRONGHORN
2	2	7	3	4	2	1	2	8	4		TOTAL SPECIES

Table 1-8. SASKATCHEWAN CHRISTMAS MAMMAL COUNTS - 1997 (continued)

SPECIES	LOCALITY & DATE	73. PRINCE ALBERT 21 December 1997	74. PR. ALBERT NP 21 December 1997	75. QU'APPELLE DAM 21 December 1997	76. RAYMORE 25 December 1997	77. REGINA 26 December 1997	78. ROCKGLEN 31 December 1997	79. ROUND LAKE (QV) 20 December 1997	80. SALT COARS 26 December 1997	81. SASK LANDING PP 23 December 1997	82. SASK R. FORKS 20 December 1997
SHREW species											
EASTERN COTTONTAIL											
NUTTALL'S COTTONTAIL							T			1	
SNOWSHOE HARE		5;2T	1;7T	1	20T	5		2	3		1;5T
WHITE-TAILED JACKRABBIT					1T	29	T				
RICHARDSON'S GR. SQUIRREL							+				
BLACK-TAILED PRAIRIE DOG											
GREY SQUIRREL											
FOX SQUIRREL						2					
RED SQUIRREL		38;2T	66;33T			1		8	4		3;6H
NORTHERN FLYING SQUIRREL											
SQUIRREL species						1					
BEAVER		1L			2L	1L		3L	2L	1	
DEER MOUSE					10T						
GAPPERS RED-BACKED VOLE		1									
MUSKRAT		3;1T				12L		9	3L		
MEADOW VOLE						2	+				
VOLE species					2T						
MOUSE species		2T									4T
NORWAY RAT											
HOUSE MOUSE											
PORCUPINE					2T		+			3T	
COYOTE		3;7T		2	1;10T	2	+	6T	1T	1	1;2H
WOLF		6;12T									
RED FOX		3T	1;16T		1T		1				
RACCOON						1T		4T			
AMERICAN MARTEN			1T								
FISHER			1T								
ERMINE											
LONG-TAILED WEASEL											
LEAST WEASEL											
WEASEL species			1T		1T						
MINK			1T						2T		
BADGER							+				
STRIPED SKUNK								1S			
RIVER OTTER			3T								
BOBCAT											
LYNX								1T			
MULE DEER				11			18	+		19	
WHITE-TAILED DEER		18;23T		8	3;30T	27	16	12T	3T	4	3T
DEER species			12T							2	
MOOSE											
ELK			4+5T								
PRONGHORN										13	
TOTAL SPECIES		9	11	4	10	10	10	10	7	7	5



Table 1-9. SASKATCHEWAN CHRISTMAS MAMMAL COUNTS - 1997 (continued)

83. SASKATOON 26 December 1997	84. SCOTT 27 December 1997	85. SHAMROCK 25 December 1997	86. SHAUNAVON 04 January 1998	87. SKULL CREEK 26 December 1997	88. SNOWDEN 27 December 1997	89. SPALDING 26 December 1997	90. SPINNEY HILL 23 December 1997	91. SPRUCE HOME 31 December 1997	92. SQUAW RAPIDS 02 January 1998	LOCALITY & DATE	SPECIES
						T					SHREW species
											EASTERN COTTONTAIL
				9							NUTTALL'S COTTONTAIL
	1T			4	2	T	T		10T		SNOWSHOE HARE
8	1T										WHITE-TAILED JACKRABBIT
				2							RICHARDSON'S GR. SQUIRREL
											BLACK-TAILED PRAIRIE DOG
						T					GREY SQUIRREL
											FOX SQUIRREL
5				4	12	1	9	2	17		RED SQUIRREL
											NORTHERN FLYING SQUIRREL
											SQUIRREL species
3T									2L		BEAVER
				3							DEER MOUSE
											GAPPER'S RED-BACKED VOLE
5		1				T			1L		MUSKRAT
5				8	1						MEADOW VOLE
1	5T										VOLE species
1						T					MOUSE species
											NORWAY RAT
					1						HOUSE MOUSE
1T				9							PORCUPINE
6;1T	2T		1	9	1	T	1		4		COYOTE
									1T		WOLF
2	1T			1	1T	T					RED FOX
1T											RACCOON
											AMERICAN MARTEN
											FISHER
									1T		ERMINE
				2							LONG-TAILED WEASEL
				1							LEAST WEASEL
						T					WEASEL species
1T				1		T					MINK
											BADGER
						T					STRIPED SKUNK
											RIVER OTTER
											BOBCAT
											LYNX
	4		12	25							MULE DEER
13;2T				14	3	T	T		26T		WHITE-TAILED DEER
4T		T									DEER species
				6	1T				1T		MOOSE
									3T		ELK
				65							PRONGHORN
12	6	2	2	16	8	12	4	1	10		TOTAL SPECIES

Table 1-10. SASKATCHEWAN CHRISTMAS MAMMAL COUNTS - 1997 (continued)

SPECIES	LOCALITY & DATE	93. ST. LUKE 26 December 1997	94. SWIFT CURRENT 28 December 1997	95. TISDALE 25 December 1997	98. WATSON 04 January 1998	99. WELDON 21 December 1997	100. WEYBURN 20 December 1997	101. WHITE BEAR 28 December 1997	102. WHITEWOOD 21 December 1997	103. YORKTON 30 December 1997	TOTAL COUNTS PER SPECIES
SHREW species					1T						3
EASTERN COTTONTAIL											1
NUTTALL'S COTTONTAIL			1					1			10
SNOWSHOE HARE									6	35T	48
WHITE-TAILED JACKRABBIT					1T		T			3T	28
RICHARDSON'S GR. SQUIRREL											3
BLACK-TAILED PRAIRIE DOG											1
GREY SQUIRREL			13				1				4
FOX SQUIRREL											5
RED SQUIRREL		2;1H				1			9	2T	50
NORTHERN FLYING SQUIRREL											1
SQUIRREL species											1
BEAVER									1L	2L	25
DEER MOUSE								T		13T	12
GAPPER'S RED-BACKED VOLE											1
MUSKRAT			1						2	12L	34
MEADOW VOLE									1	8T	18
VOLE species							T		1T		12
MOUSE species					2T		T				19
NORWAY RAT											2
HOUSE MOUSE							2				4
PORCUPINE		1T						1		2T	31
COYOTE		3;1T			2T		1	4	2	2T	75
WOLF											10
RED FOX					2T		2		1		36
RACCOON						2T					10
AMERICAN MARTEN											1
FISHER											1
ERMINE											7
LONG-TAILED WEASEL										1T	8
LEAST WEASEL										1T	9
WEASEL species					1T						11
MINK			2							1T	16
BADGER											6
STRIPED SKUNK									1		14
RIVER OTTER											3
BOBCAT											3
LYNX											1
MULE DEER			10					76			25
WHITE-TAILED DEER		3;3T			8T	3T	5		8	4	68
DEER species											8
MOOSE											12
ELK											7
PRONGHORN											6
TOTAL SPECIES		4	5	0	7	3	8	5	9	13	



# PLANTS

## MILKWEED: THE MONARCH'S PRAIRIE HOST

ANNA LEIGHTON, 328 Saskatchewan Crescent West, Saskatoon, SK S7M 0A4

Milkweed has a Jekyll and Hyde image over much of its range. Its useful role as the Monarch butterfly's host plant lives in the shadow of its reputation as a killer of livestock. In Saskatchewan, however, where milkweed is not a problem for livestock and Monarchs are scarce, this plant is poorly known.

This article introduces our five native milkweed species. It complements what we know about the Monarch butterfly in Saskatchewan (see article, this volume) by describing the distribution and characteristics of these unusual and distinctive members of our flora.

Two species, Silky and Whorled Milkweed are rare plants restricted to the southeast corner of the province. The other three, Green, Low and Showy Milkweed, occur widely in the grassland and adjacent parkland (scientific names for all five are given below). A sixth species, Swamp Milkweed (*Asclepias incarnata*) was reported to occur "Throughout Canada to the Saskatchewan" by Thomas Drummond, a naturalist with John Franklin's second overland expedition in 1825-1827,<sup>7</sup> but this species remains undocumented west of south-central Manitoba. All but Whorled Milkweed have been noted as host plants for Monarch caterpillars in the Prairie Provinces.<sup>1,5</sup>

**The Milkweeds** Opposite simple leaves and milky juice set most of Saskatchewan's milkweeds apart

from our other wildflowers except Dogbane (*Apocynum androsaemifolium*), Indian Hemp (*Apocynum cannabinum*) and possibly some of the spurge (*Euphorbia* sp.). Milkweeds differ from all other plants in their flower structure and pods.

The flowers are unmistakable. The petals are turned back at maturity and where the petals ought to be there are five hollow structures called hoods (b, Fig. 1). These surround the anthers and pistil which are fused together to form a flat-topped, round column called the gynostegium. In all our species, except Green Milkweed, a "horn" arises from within each hood (d, Fig. 1) and arches toward this central column. The flowers occur in showy, colourful heads, as in Silky and



Figure 1. Milkweed flower, showing petals (a), hoods (b), gynostegium (c) and horns (d).





Figure 2. Unripe pod of Green Milkweed

Anna Leighton

Showy Milkweed or in inconspicuous, pale-coloured clusters, as in the other species. In spite of the large number of flowers per head, most plants produce only a few pods per year.

Milkweed pods (Fig. 2) are inflated and thin-walled, and contain hundreds of round, flat seeds. In areas where Silky Milkweed is common, the pods are much enjoyed by children for the tightly packed rows of seeds which burst forth, each with its own parachute, when the pods are opened. The empty pods are silky smooth inside and, according to Anna Comstock, they "snapped shut so easily, we imprisoned therein bumblebees 'to hear them sing'..."<sup>3</sup> In contrast, *Apocynum* species have pencil-thin, woody, brown pods. These often persist on the previous year's stalks among the flowering plants.

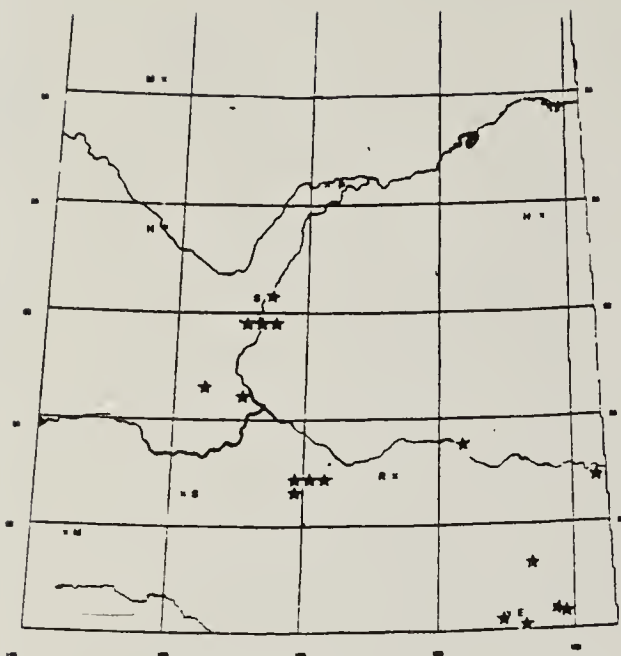
The following descriptions of Saskatchewan's native milkweed species are derived from four major

references on the plants of our area.<sup>6,9,10,12</sup> Information felt to be regionally variable, such as flowering date, habitat, population size and height of the smaller species, is based on Saskatchewan specimens housed in the W.P. Fraser Herbarium at the University of Saskatchewan, as are the locations shown on the distribution maps.

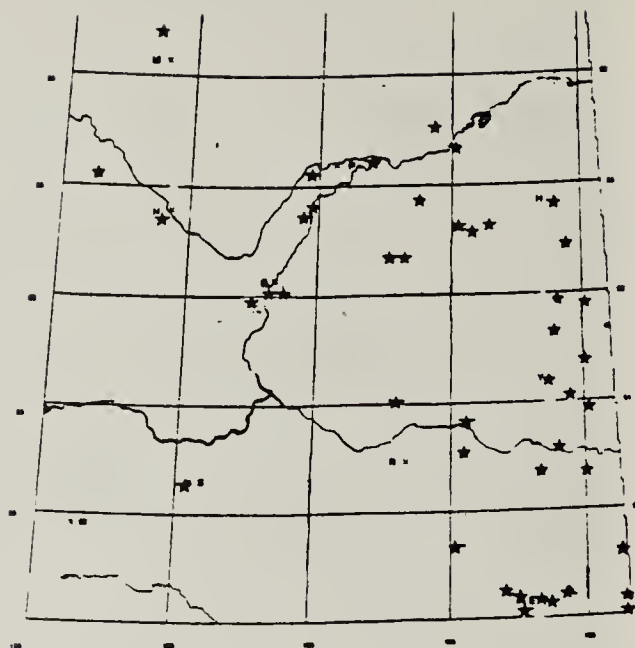
**Green Milkweed** *Asclepias viridiflora* (Map 1). Green Milkweed is the only Saskatchewan species that lacks horns (some taxonomists place it in the genus *Acerates*, for this reason). It has compact, golf-ball sized clusters of greenish flowers (Fig. 3) and a coarse, untidy appearance due to irregularly spaced, thick leaves with somewhat wavy margins and a rough hairiness over the entire plant.

This low plant (most are 20-37 cm high) grows on dry prairie hillsides, sandhills and stabilized sand dunes. It flowers from late June to the third week in July, with occasional late flowerings (12 August 1960).

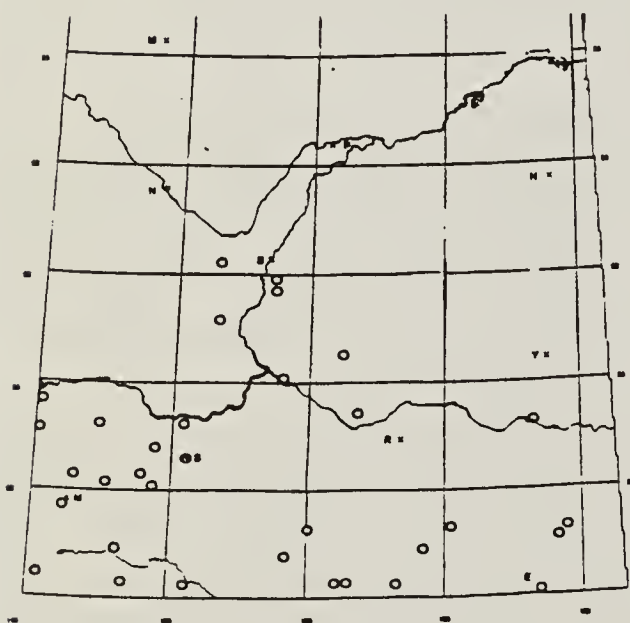




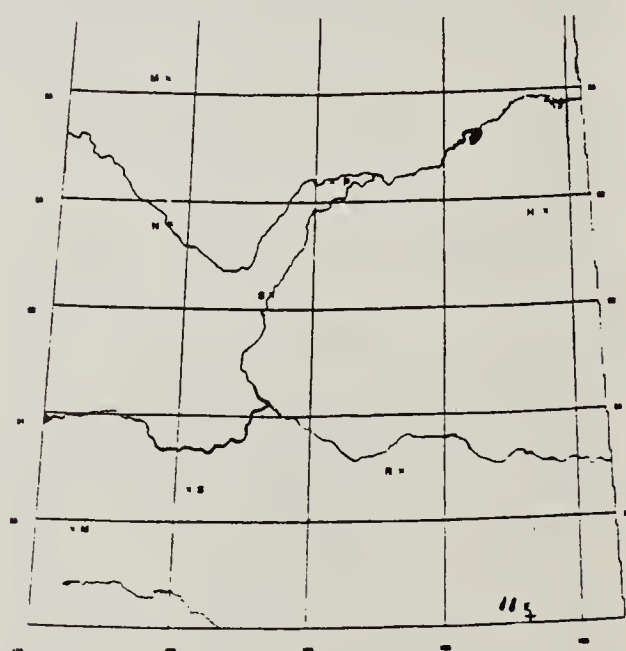
MAP 1 : GREEN MILKWEED



MAP 2 : LOW MILKWEED



MAP 3 : SHOWY MILKWEED



MAP 4 : SILKY MILKWEED +  
WHORLED MILKWEED

Map 1 (top left): Green Milkweed. Map 2 (top right): Low Milkweed. Map 3 (bottom left): Showy Milkweed. Map 4 (bottom right): Silky Milkweed, Whorled Milkweed.

E = Estevan; H = Hudson Bay; M = Meadow Lake (54°); M = Maple Creek (49°); N = North Battleford; R = Regina; S = Saskatoon (52°); S = Swift Current (50°); Y = Yorkton.





Figure 3. Green Milkweed Jim Romo

Green Milkweed leaves vary in shape from ovate to linear. The narrow-leaved variety, *Asclepias viridiflora* var. *linearis*, is common in the Saskatoon-Dundurn area.

Saskatchewan has the most widespread population of Green Milkweed of any province in Canada. This species is considered rare in Alberta and Ontario, and uncommon in Manitoba. It also occurs in B.C. and extensively in the Great Plains south of the border, east to New England and south to Georgia and New Mexico.

**Low Milkweed (Dwarf or Oval-leaved Milkweed)** *Asclepias ovalifolia* (Map 2). Although called Low Milkweed, in Saskatchewan this species is taller (most are 30-47 cm) than Green and Whorled Milkweed. In contrast to Green Milkweed, this plant has a tidy appearance. The plants are slender, less hairy and the leaves are symmetrical and regularly spaced along the stem. Of all our milkweeds, this one looks most like Dogbane.



Figure 4. Showy Milkweed Jim Romo

The flowers are greenish-white to pale yellow and the main cluster grows from the tip of the plant. If there are other clusters, these arise lower down on the stem at the base of the upper leaf stalks. The small number of flowers (4-20) on long stalks give the flower clusters an open and delicate appearance. (See photograph p. 223.<sup>15</sup>)

This is the second most common milkweed in Saskatchewan where it grows in a wide variety of habitats: moist prairie, slopes of all aspects, creek banks, tops of levees and low hills, edges of wetlands and bluffs, and forest clearings. The principal flowering period is mid-June to mid-July, with 3 June 1980 and 2 August 1954, being the extremes recorded. Populations may consist of scattered individuals but this species often grows in patches, the largest one recorded for Saskatchewan being 125 m square, noted by John Hudson at Pike Lake, 14 July 1968.

Low Milkweed is a plant of the northern plains; it occurs primarily in the prairie provinces and the northern





Figure 5. Monarch caterpillars eating Silky Milkweed flowers

Anna Leighton

prairie states (east to Illinois). Other locations in Canada are northwestern Ontario and southeastern B.C.

**Showy Milkweed** *Asclepias speciosa* (Map 3). Showy Milkweed is a coarse plant with broad leaves and robust heads of 10-40 large (1-2 cm) flowers (Fig. 4). Most of our plants are fuzzy with a dense coat of fine, matted hairs. The flowers are rose-purple and have tapering hoods at least 1 cm long. Another distinctive feature of this species is that the base of the leaves, where they attach to the leaf stalks, are rounded, sometimes even heart-shaped, rather than tapered.

This is the most common milkweed species in Saskatchewan. It is a medium sized plant (30-100 cm) which grows along roadsides and railways, on disturbed ground and in moist habitats such as lake shores, creek banks and flood plains. Spreading by underground roots, Showy Milkweed can form large patches on abandoned land. A

patch near Tessier described by John Hudson on 27 July 1985 was "a solid stand about 1 acre" (0.4 ha).

The main flowering period is late June to the end of July, with June 23 the earliest recorded date. The fragrant flowers have a reputation for causing drowsiness in people and insects.

Showy Milkweed is a western species both in Canada (southern B.C. to southern Manitoba) and the United States (west of the Mississippi River).

This species may be difficult to distinguish from Silky Milkweed. The most reliable characteristic is the length and shape of the hood. Showy hoods are more than 10 mm long and start to taper about halfway along their length. Silky hoods are less than 8 mm long and taper little if at all.<sup>4</sup>

**Silky Milkweed** (Common Milkweed) *Asclepias syriaca* (Map 4). Although Silky Milkweed tends to be



taller than Showy Milkweed, it is less coarse in appearance, having a narrower stem, narrower leaves and a thinner coat of hair. The plants are ornate, with multiple heads of up to 130 delicate purplish flowers on slender stalks (Fig. 5). The Saskatchewan population begins to flower in early July.

In Saskatchewan, this plant is known from only one site — a pasture in the Souris River Valley near Pinto. John Richardson, who travelled through Saskatchewan in the early 1800s, noted that the Canadian range of this plant was "Canada to the Saskatchewan." This may suggest that Silky Milkweed was more widespread in Saskatchewan at that time.<sup>7</sup> Saskatchewan is at the northwestern edge of this plant's extensive range in Canada (east to Nova Scotia) and in eastern, central and southwestern United States.

Although a rare plant in Saskatchewan, Silky Milkweed is common and abundant over much of its range, forming large patches in meadows, fields and waste places and along roads and railroads. It is the principal host plant of the Monarch in Canada and the milkweed most familiar to people in northeastern North America. Because of its ability to aggressively invade disturbed ground, it is classed as a noxious weed in Nova Scotia, Ontario, Manitoba and Saskatchewan. Only Nova Scotia and Manitoba have active control programs however: there are too many plants to control in Ontario.<sup>16</sup> In Saskatchewan, Silky Milkweed is a protected rare plant and is listed in the province's 1984 Noxious Weed Act (under the name Common Milkweed).

**Whorled Milkweed** *Asclepias verticillata* (Map 4). This rare Saskatchewan plant looks completely unlike our other milkweeds: the leaves are

very narrow (0.5 — 1.5 mm) and short (30 — 70 mm) and are attached to the stem in groups of three to six (an arrangement called whorled or verticillate) (Fig. 6). The pods are narrow and attached to the stem by upright stalks instead of stalks turned down as in our other milkweed species (cf. Fig. 2). This is the shortest milkweed in Saskatchewan: most plants are between 14 and 37 cm tall, with a maximum height of 45 cm.

The habitat is varied, including slopes (dry south-facing slopes and moister sites in coulees), mixed-grass prairie and the bottom of the Souris River valley. The plant occurs as scattered individuals or, rarely, in colonies.

The flowering dates on the herbarium specimens are 19 and 20 July and 4 and 23 August. The clusters of small, numerous, whitish flowers arising near the top of this slender plant make it look, from a distance, more like Northern Bedstraw than the other Saskatchewan milkweeds.

The Saskatchewan population is at the northwestern edge of this plant's range. Whorled Milkweed also grows in southern Manitoba and southern Ontario and increases in abundance southward across the border into the northern Great Plains, extending eastward to New England and south to Texas.

Whorled Milkweed is the most toxic milkweed in Saskatchewan but, like all milkweeds, it is unpalatable and animals eat it only when nothing else is available.

### **Simple Key to Flowering Saskatchewan Milkweeds**

Flowers pink-purple (very occasionally white in Silky Milkweed)

- hoods at least 11 mm long — Showy Milkweed



- hoods at most 8 mm long — Silky Milkweed
- Flowers greenish-white, creamy or yellow
- leaves whorled — Whorled Milkweed
- leaves opposite: horn present — Low Milkweed; horn absent — Green Milkweed

@NOIND = **Milkweed and Butterflies** Milkweeds are prolific nectar producers and many of our butterflies visit the flowers for food, including the Great Spangled Fritillary, Delaware Skipper and the Monarch.<sup>1</sup> The milkweed plant, especially the milky juice, is toxic to most insects and the only caterpillar that feeds on the plant itself is the Monarch's. These caterpillars consume the poisonous milkweed unharmed and use the toxins, which they store in various tissues, to deter avian predators and possibly insect parasites.<sup>13</sup>

Milkweed toxins are cardiac glycosides called cardenolides. They occur in all stages of the Monarch's life, starting with the eggs, which may contain sufficient cardenolides that only 74 of them can make a

Blue Jay sick. When the larvae hatch, they feed on milkweed leaves, buds and flowers, gathering and storing cardenolides. In addition to storing chemicals as a deterrent, they can spurt out cardenolide-rich fluid when provoked. The chemicals are found in the pupae and the adults as well. Wild butterflies contain anywhere from no cardenolides to ten times the dose required to make a Blue Jay sick, depending on which species of milkweed the larvae fed upon.<sup>2</sup>

A description of a Blue Jay's reaction to these chemicals illustrates why they are powerful deterrents: "The effects of cardenolides ... include retching, vomiting, excessive bill-wiping, alternate fluffing and flattening of feathers, erratic movements about the cage, head and wing jerking, partial eye closure and a generally sick appearance."<sup>2</sup>

Cardenolides from different milkweed species have different chemical compositions. Using these chemicals, researchers have been able to determine the species of milkweed that Monarchs feed on during migration and this has helped

Table 1. COMPARING SASKATCHEWAN MILKWEED SPECIES (LISTED IN ORDER OF FLOWERING DATES)							
Species	Flowering dates	Flower colour	# of flowers/ head	Height	Leaf arrangement	Range in Canada	Unique feature
Low	mid-June to mid-July (June 3, August 2)	greenish white - pale yellow	4-20	30-47 cm (15 cm, 60 cm)*	opposite to sub-opposite	S.E. BC to N.W. ON	main flower cluster at tip of stem
Green	late June to 3rd week of July (August 12)	green	20-80	20-37 cm (15 cm, 40 cm)*	opposite to alternate	S.E. BC to ON	lacks horn
Showy	late June to late July	rose-purple	10-40	30-100 cm	opposite	S. BC to S. MB	hoods 11 mm or longer
Silky	early June to ?	rose-purple (white)	20-130	60-200 cm	opposite	S.E. SK to NS	hoods less than 8 mm
Whorled	mid-July to mid-August ?	greenish-white	6-20	14-37 cm (45 cm)*	whorled	S.E. SK to ON	linear, whorled leaves
An asterisk indicates data based on Saskatchewan specimens. Extremes are given in parentheses.							

understand migration patterns.<sup>8</sup> When Monarchs leave their wintering sites in Mexico, the females fly into southern United States and lay eggs on milkweed species that flower there in early spring. Adults reared on these plants arrive in Saskatchewan in June to lay their eggs on our milkweeds. The butterflies raised here migrate back to Mexico to spend the winter.

Milkweeds are excellent plants for butterfly gardens. All our native species should survive as perennials in Saskatchewan gardens. Species from outside our area may not overwinter. Milkweeds establish well from seeds, bought or collected, and from young plants.<sup>14</sup> To control the spread of plants in and around the garden, the seed pods must be removed before they ripen. Otherwise the abundant seeds burst from the pods and disperse widely on the wind.

**Toxicity** The chemicals that protect Monarchs from birds are toxic to livestock when milkweed is consumed directly. Cardenolides consumed at doses much lower than fatal ones will cause an animal to vomit, thus averting poisoning. Some animals, however, such as sheep which cannot vomit, can be poisoned by consuming as little as 0.2% of their body weight of dried milkweed.<sup>11</sup>

Surprisingly little research has been done on the milkweed cardenolides, but it is known that some act on the nervous system, others on the digestive system and all affect the heart.<sup>11</sup> Cardenolide concentration, and therefore toxicity, is greatest in milkweed species with narrow leaves and in southern plants — either species with a southern distribution or southern populations of widespread species such as Showy Milkweed. Whorled Milkweed



Figure 6. *Whorled Milkweed* (source: Gleason, Henry A. 1952. *The New Britton and Brown Illustrated Flora of the Northeastern United States and Adjacent Canada*. Vol. 3. The New York Botanical Garden.)

is Saskatchewan's only narrow-leaved milkweed and our most toxic species, affecting both the nervous system and the heart when ingested by sheep in small doses. Whether the other species native to Saskatchewan are toxic to livestock is unclear from the literature.

**Acknowledgements** I would like to thank Bernie Gollop and Vernon Harms for assistance with this article; Jean Timpa, of the Blomidon Naturalists Society, N.S., for identification of milkweed species from my photographs; and Jim Romo for pro-



viding two of the illustrations.

The author welcomes information from readers on Saskatchewan milkweeds and can be reached by e-mail (leighton@sk.sympatico.ca) as well as through the address at the beginning of this article.

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In all things of nature there is something of the marvellous.  
*Aristotle*

## 1997 — YEAR OF THE MONARCH IN SASKATCHEWAN

BERNIE GOLLOP, 2202 York Ave., Saskatoon, SK S7J 1J1 and MIKE GOLLOP, 51 Welker Cresc., Saskatoon, SK S7N 3M3

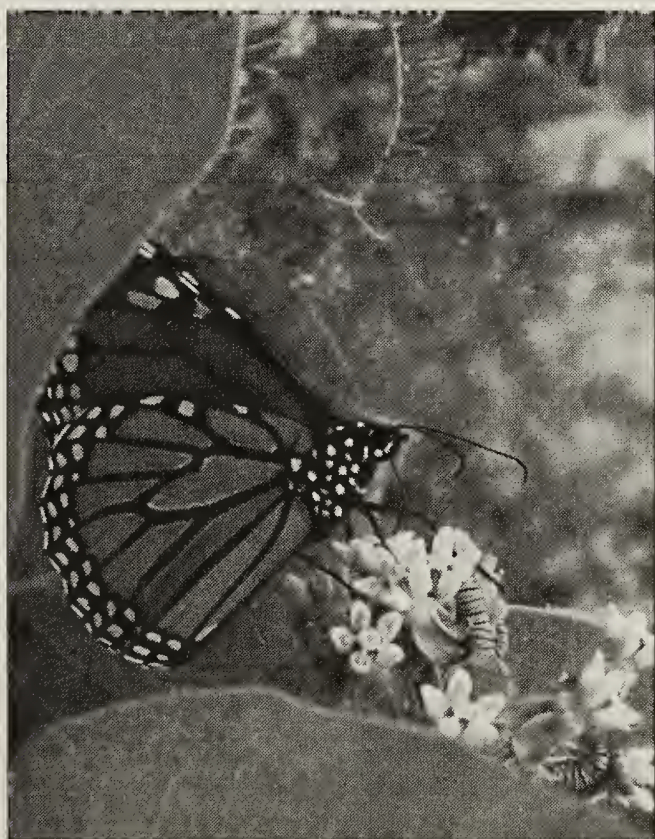
The year 1997 was the year of the Monarch (the butterfly, that is) in Saskatchewan. This largest of our butterflies — rich, dark orange with prominent black veins on a 10-cm wingspread — is usually a scarce commodity. It quickly became evident, however, that 1997 was different. The earliest report was by Maureen Somers at Waskesiu on 5 June. She also saw them on two or three of the next six days on the Saskatoon campus.

Then came the deluge. On 12 June Dennis Fisher, Lorriene and Craig Salisbury reported singles in their Saskatoon yards and Doug Paterson saw several at Fort Qu'Appelle;

on 13 June, singles were reported from the Salisbury yard, from Chelan by John Kozial and from Ernfold by Ron Hooper. On 14 June, Fisher, the Salisburys and Jim Sullivan each saw one in Saskatoon; Kozial reported one from Bjorkdale; Hooper, one from Consul, and Lawrence Beckie up to three from Kenaston. On 15 June singles were seen at Kenaston, near Herbert by Hooper, at Saskatchewan Landing Provincial Park by Michael Williams and near Rosthern by Len Wassenaar.

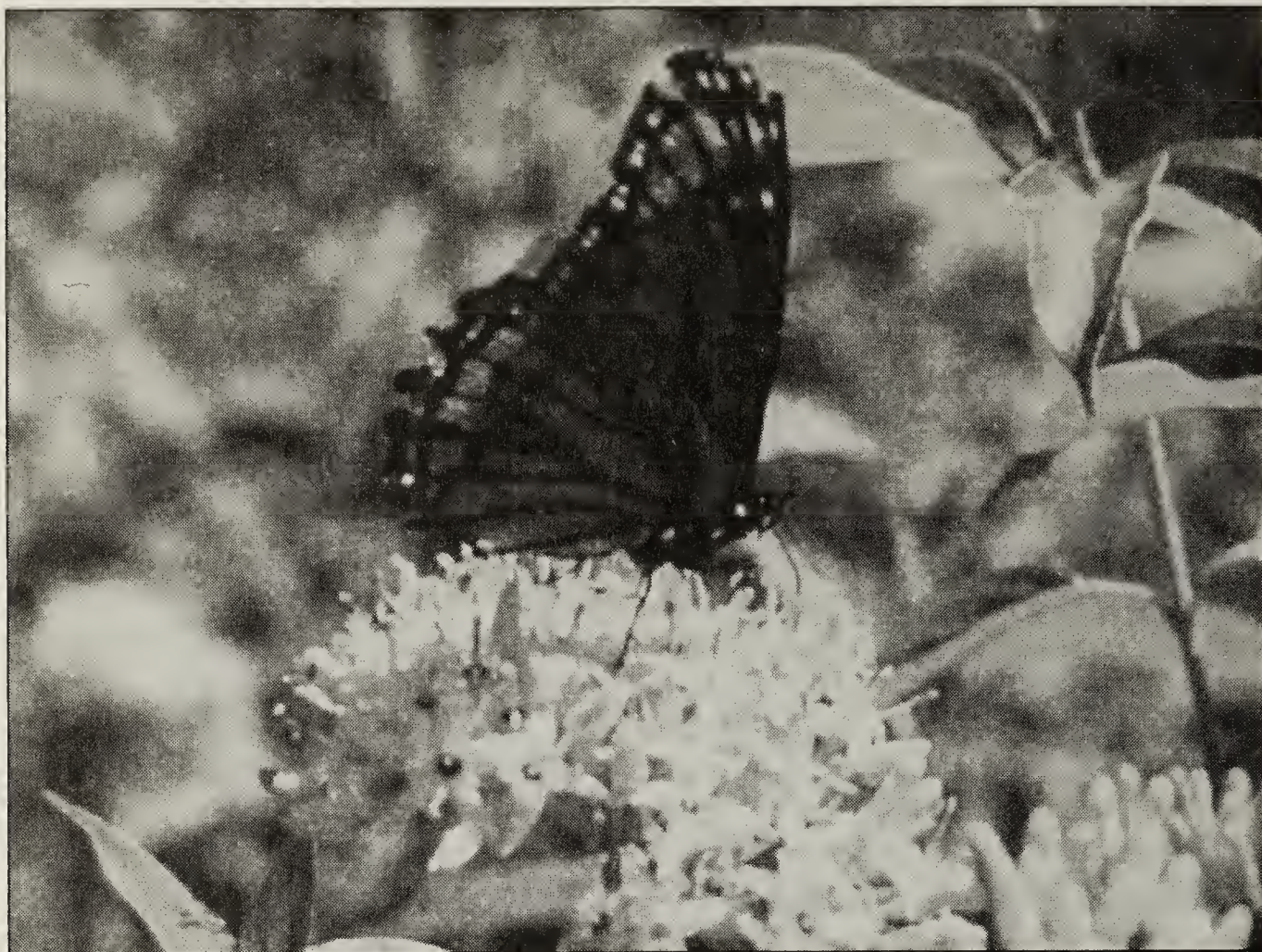
Monarchs do not overwinter in Saskatchewan in any stage — egg, caterpillar, chrysalis or adult. The Monarchs we see in spring are the progeny of butterflies that left their overwintering sites above 3,000 m in the mountainous Oyamel Fir forests (*Abies religiosa*) west of Mexico City in March. (These forests are a glacial relict of our own boreal forest ecosystem.) The Monarchs laid eggs in states around the Gulf of Mexico during the last month of their lives and four weeks later some 100 million adults emerged and continued a mass migration northward to populate the eastern two-thirds of North America for another year. (West Coast Monarchs winter in California.)

The 1997 spring migration of Monarchs was monitored on the Internet. The first US report read as follows: "Saw the first two monarchs in Galveston Bay, Texas, fluttering about the apple tree blossoms" on



*Monarch nectaring on Silky Milkweed in Maine* Anna Leighton





*Viceroy. Much smaller than the Monarch, with a black line crossing veins on the hind wings and with one row of white dots, rather than two, along the outer margins of the wings. It has a frenetic, rather than leisurely, flight.*

*Anna Leighton*

28 February (!!!!!). Most observations to 15 March were in southern Texas and Louisiana. By 15 April the vanguard stretched from Kansas to New Hampshire. During the first two weeks of May, Monarchs entered Canada in Ontario and Quebec; further west, they had only reached Nebraska. It would be another month before they were welcomed in Saskatchewan.

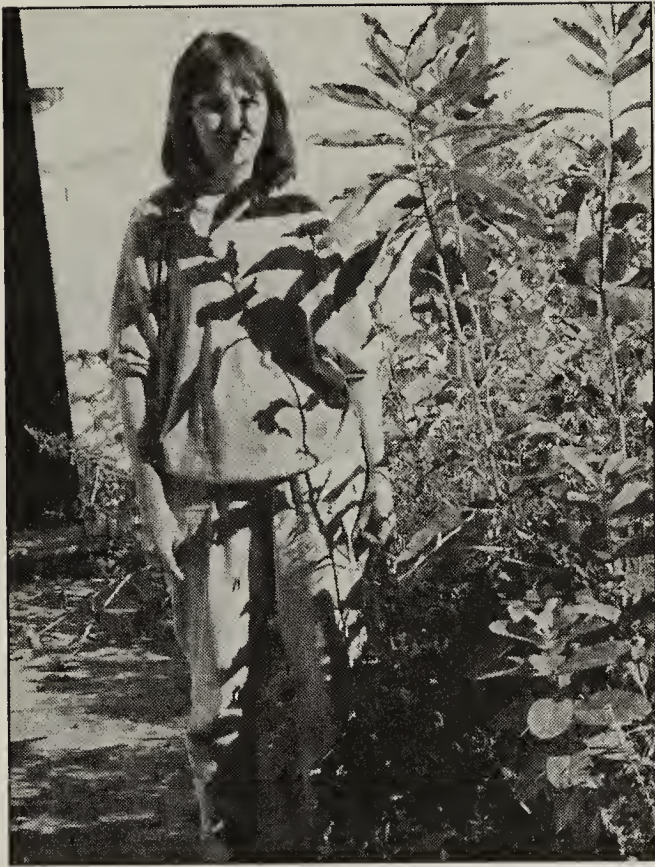
The 1996 Status Report of the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) notes that "in Saskatchewan, where Monarchs are also scarce and irregular, none was reported in 1993 but in 1994 a small migration occurred with a total of 20 Monarchs being reported in the province." Normally, we (the authors) see one Monarch, if any, in a year. In 1997 we saw 53 between 17 June and 17 August. We found them on seven of

nine 4 July Butterfly Counts (4JCs: part of an international survey, conducted within a month of 4 July); in 1996, we saw them on none of six. The Big Day was 31 July on the Roche Percee 4JC — 15 Monarchs.

To get a better idea of Monarch distribution in Saskatchewan, we contacted other people for their observations. Twenty-six reporters found Monarchs in 70 townships from the borders of Manitoba, the United States and Alberta, north to Prince Albert National Park (see map). They represent at least 40 dates and well over 250 individuals.

Ron Hooper reports that 1997 was a "good summer" for Monarchs in Saskatchewan. John Kozial summarized his 1990s experience with Monarchs in the Bjorkdale-Tisdale area as follows: 1990-1994: none; 1995: 2 or 3; 1996: 12; 1997: 25.





Joanne Blythe beside her tall and short milkweed patch at 1209 Munroe Ave., Saskatoon

Bernie Gollop

Robert Gebhart, a science teacher, saw them for the first time in his 20 years at Eastend, although he had checked milkweed patches regularly.

Over the years, the most northerly reports in the province have been from Cumberland House and the above record for Waskesiu. Looking further north, there is a single specimen for the Northwest Territories. The farthest-north breeding record for Monarchs in Saskatchewan is near Chelan (40 km north and 210 km east of Saskatoon), where Don Hooper found adults emerging.

**Breeding** We know of five breeding records for 1997. Two of these demonstrate the butterfly's amazing ability to find milkweed — even if it is only a single plant. Paule and Dale Hjertaas had a Swamp Milkweed (*Asclepias incarnata*; not native to Saskatchewan) in a pot in the artificial pond of their Olson Place backyard in Regina. In June a Monarch

showed up, laid four or five eggs on the plant, disappeared, and several minutes later, the same or another Monarch laid a few more eggs. Paule and Dale were away for July and when they returned there was no sign of Monarchs.

In Saskatoon in 1992, Joanne Blythe added Silky (Common) Milkweed seeds (*Asclepias syriaca*) to her Munroe Avenue backyard, which now has some 30 kinds of flowers and herbs. Nothing appeared, so she tried again the next year, producing one plant. The 13 stalks she has now (two about 2 m tall) are the product of this survivor. In June 1997 a Monarch visited her metre-wide milkweed patch. A short time later at least five caterpillars came under study as they nourished themselves on the leaves. Eventually, two chrysalids were found. One, on the underside of a milkweed leaf, turned dark brown and stayed that way (see photo). However, a Monarch emerged from the other in late July or early August; its pupa was 5 m from the milkweed patch, lying on the upper side of a large leaf of Coltsfoot (*Tussilago farfara*).

South of Eastend, Robert Gebhart found 11 caterpillars in a milkweed patch along an irrigation ditch on 9 July. At the Gun Range, 3 km away, he found two more on milkweed on 10 July. On 22 July an irrigation surge came through, washing away larvae on the lower bank. Robert found three or four near the top of the ditch on 29 July. On 1 September no signs of Monarchs in any stage could be found.

Wayne Harris found caterpillars just north of Maple Creek on 1 August and near Roche Percee on 23 August.

In Saskatchewan, lilacs, standard and miniature (*Syringa vulgaris*),





Caterpillar on Showy Milkweed near Eastend (*Asclepias speciosa*).  
Sunflower seed for scale

Robert Gebhart

seemed to be the favourite nectaring plant of adults. Dennis Fisher's Monarch supped on the flowers of chives while Joanne Blythe's newly emerged adult concentrated on Red Clover (*Albium schoenoprasum*, *Trifolium pratense*). In the country, they were seen on alfalfa, Common Dandelion, snowberry, Tansy and Canada Thistle (*Medicago sativa*, *Taraxacum officinale*, *Symphoricarpos*, *Tanacetum vulgare*, *Cirsium arvense*).

The Monarchs we saw in June were in good shape — rich "plumage" and undamaged wings. Within a month they had faded and become ragged, but they had already laid eggs on their caterpillar host plants, milkweed and, to a lesser extent, dogbane (*Apocynum*). Most of the 15 adults on 31 July appeared to be freshly emerged — bright and in perfect shape; only a few were pale and tattered.

**Fall Migration** On 17 August, Bernie Gollop saw three Monarchs, in fresh

condition, moving in an easterly direction over a piece of prairie on the north edge of Saskatoon; Mike Gollop saw one 3 km north of the city, and the Salisburys saw another in their yard. Combined, these records suggest the butterflies were starting to migrate. The only later dates we know of were Doug Paterson's 22 August Monarch in Regina; 30 August, when Michael Williams saw one 135 km east of Saskatoon, gaining altitude and heading southeast; 7 September — Bob Gebhart discovered one in Eastend, and 9 September when Wayne Harris found one near Roche Percee.

So, excluding stragglers, Monarchs were with us for about two months in 1997 — mid-June to mid-August. Their stay began with a generation spawned from eggs laid in Texas and Louisiana (and perhaps further north) and ended with a new generation of adults emerging in Saskatchewan and migrating south. They will live until they have laid eggs in the southern states in the





*Dead chrysalis on underside of milkweed, Munroe Ave., Saskatoon*

*Bernie Gollop*

spring of 1998. Only the Monarchs "born" in Saskatchewan, then, fly 3500 km south, possibly guided by geomagnetic forces, during their three-month migration. They make flights up to 130 km per day at speeds as fast as 32 km per hour and altitudes to 3 km. They will spend about four months in Mexico (late November to early April) and it will take them and their progeny about three months to repopulate the north countries.

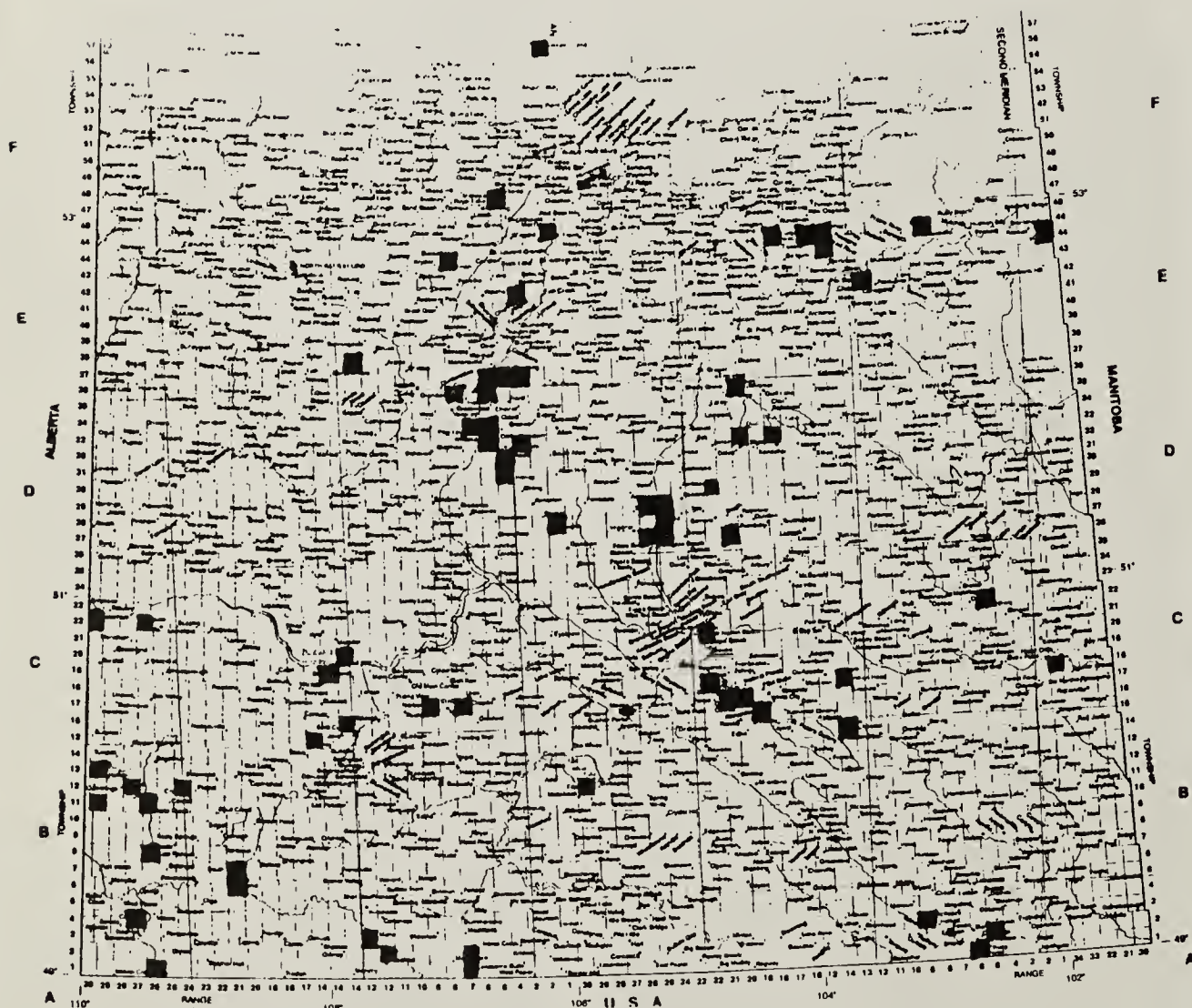
The major factor allowing many Monarchs to reach Saskatchewan may well be weather. The previous year's weather has to have been good enough to allow at least an average number of Monarchs to reach Mexico. Winter weather has to have been such that there is low mortality and spring weather in the United States has to have been good for reproduction. The year 1979 was also a good year for Monarchs (as well as Painted Ladies) around Saskatoon.

Paul Klassen and David Delf noted more Monarchs than usual in Manitoba in 1997 with late dates of 13 and 14 September. In southern Alberta, Ted Pike did not see one in the course of considerable field work. Our Alberta observations were of two, 1 July, on the South Saskatchewan River at Hwy 41, south of Empress, and singles in Medicine Hat on 15 and 17 July. Bob Kreba saw two along the South Saskatchewan River south of Suffield, Alberta, 18 June.

**Conservation Status** Monarch migration and overwintering concentrations were declared a Threatened Phenomenon — the only event ever so designated — in 1983 by the International Union for the Conservation of Nature and Natural Resources and the World Wildlife Fund (WWF). Such a phenomenon is defined as a spectacular aspect of the life history of an animal or plant species involving a large number of individuals that is threatened with impoverishment or demise. The species *per se* need not be in peril; rather, the phenomenon it exhibits is at stake. The wintering aspect is well known. An example of the southward migration phase would be an 1885 observation from Brigantine, NJ: "almost past belief ... millions is but feebly expressive ... miles of them is no exaggeration." Further south, some Monarchs may successfully cross the Gulf of Mexico using a network of 3,000 rest stops referred to as oil and gas rigs.

The vulnerability of the Monarch has been compared to that of the Passenger Pigeon. In 1995 it was featured in a set of Canadian stamps entitled *Migratory Wildlife*. Congress is considering its designation as the national insect of the United States. The WWF has included this butterfly in its set of six 1997 stamps depicting animals and plants at risk.





Map 2 (bottom): Adult Monarch distribution in Saskatchewan by township, based on 1997 observations.





*Monarch wintering concentrations on Oyamel Fir in Mexico*

*Keith Hobson*

In 1997 the Monarch became one of three butterflies — and the only one occurring in western Canada — to be put on the COSEWIC list. It is classified as Vulnerable because, in Canada, its primary caterpillar host plant (milkweeds) is officially a noxious weed in some provinces and is being eradicated. (Silky or Common Milkweed is so designated in Saskatchewan.) In Mexico, Oyamel Fir is harvested as valuable timber and firewood and the butterfly's 10 wintering sites have no effective protection. Most are under a half hectare (1.2 acres) each and all are concentrated in an 800-sq-km area — just over a quarter the size of Prince Albert National Park. According to a December 1997 TV special on the Monarch, up to 7000 tourists a day visit the two sites in Mexico open to the public. One roost in California hosts 60,000 visitors a season.

If Canadian Monarchs were restricted to only a few of these Mexican colonies, the threat to our population would be even greater.

Len Wassenaar, National Hydrology Institute, and Keith Hobson, Canadian Wildlife Service — both with Environment Canada, Saskatoon — are investigating this possibility. They are analyzing the ratio of deuterium to hydrogen in the wings. Due to climatic factors, this ratio occurs as a gradient, at least in plants, songbirds and butterflies, from north (lowest) to south (highest). In butterflies, the value of the ratio remains constant after the adults emerge, permitting researchers to determine at what latitude butterflies in wintering congregations originated. Preliminary results indicate that Canadian Monarchs are widely distributed through the wintering sites.

In California, although much smaller numbers of Monarchs are involved, the picture is not much better. They congregate primarily on Blue Gum (*Eucalyptus globulus*) trees along 900 km of coast. Efforts are now being made to eradicate the Eucalyptus — an Australian import — as a “pest” tree. However, multi-million-dollar developments — for housing, motels and recreation complexes — may be an even greater threat. At least 21 roosting sites have been destroyed; about 130 remain.

*We would much appreciate hearing about other Monarch observations in the prairie provinces, both for 1997 and 1998 — numbers and places (mainly) but also dates, as close as possible. Phone: (306) 343-1027; e-mail is [mgollop@sk.sympatico.ca](mailto:mgollop@sk.sympatico.ca); regular mail, as above.*

**Acknowledgments** Our thanks to the people named above and to the following for reporting observations: Ken Coutu, Mel Fitch, John Lake, Ken Pivnick, Don Reynard, Keith Roney, Angela Salzl, Lloyd Saul, Phil Taylor and Jim Wood. Special thanks also to those contributing photographs and to Anna Leighton





Left: Monarch on World Wildlife stamp

Right: Monarch from Canadian stamp set — Migratory Wildlife

for writing the accompanying milkweed article.

Most of the non-Saskatchewan information in this article came from two publications and two web sites:

From papers delivered at a conference in California and published as "Biology and conservation of the Monarch butterfly," edited by Stephen Malcolm and Myron Zalucki. Natural History Museum of Los Angeles County. 1992. 419 pages.

From an 85-page article by Lincoln Brower entitled "Understanding and misunderstanding the migration of the Monarch butterfly (*Nymphalidae*): 1857-1995" in Volume 49 (1995) of the *Journal of the Lepidopterists' Society*.

The web site for Monarch migration is:

<http://www.learner.org/content/k12/jnorth/1997/critters/monarch/858039639.html>

For the 19-page status report leading to the Monarch's Vulnerable designation in Canada, see:

<http://www.keil.ukans.edu/~monarch/temp/canada/monarch/1.htm>.

More accessible additional reading, hopefully in library or bookstore, may be found in:

The nature of Monarch butterflies. 1997. By Eric Grace. Greystone Books, Vancouver, BC. 114 pages.

The great butterfly hunt. 1990. By Ethan Herberman. Simon & Schuster, NY. 48 pages.



Birds are subject to invasion by one or more of the following parasites: fungus, amoeba, flagellate, plasmodium, spirochaete, trypanosome, encapsulated tongue worm, fluke, roundworm, spiny-headed worm, tapeworm, tongue worm, leech, flea, feather louse, fly larva, louse fly, mite and tick.

## SKIN PIGMENTATION CHANGE IN TIGER SALAMANDERS, *Ambystoma* *tigrinum*, FROM ALBERTA

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An adult male Tiger Salamander (*Ambystoma tigrinum*) captured in Bow Valley Provincial Park near Canmore, Alberta in August 1977 has been maintained in captivity for 20 years. This apparently represents the oldest known individual of this species (21.5+ years). A substantial reduction in the number and extent of irregular black markings on the dorsum and sides of the salamander during its period of captivity is documented. Most pigmentation change occurred within the first three to six years of captivity. Similar changes were also observed on a female Tiger Salamander maintained in captivity for a shorter period. Regardless of the cause(s) for these changes, this confirms that subspecific identification of individual Tiger Salamander specimens should not be based entirely on pigmentation pattern.

Dunn (1940) describes seven subspecies of the Tiger Salamander, *Ambystoma tigrinum* (Green), in North America. His diagnoses are heavily dependent on the pattern of light and dark pigmentation on the dorsum and sides of adults. This treatment has been widely accepted and is followed by Stebbins (1966), Gehlback (1967) and others. Dunn (1940) and Gehlback (1967) note, anecdotal, that the lightly pigmented areas usually expand considerably as individuals age. By their application of pigmentation patterns for subspecific differentiation of Tiger

Salamander populations, we can reasonably infer that these authors considered pigmentation patterns to be  $\pm$  stable within particular populations. Observations on captive Tiger Salamanders made between 1977 and 1997 have provided an opportunity to test this by documenting the scale and pattern of the changes in skin pigmentation over time on individual animals (below).

A Tiger Salamander was captured as it and many others of its species (several hundred?) crossed a rain-soaked roadway in a sandy Lodgepole Pine (*Pinus contorta*) forest in Bow Valley Provincial Park in the eastern foothills of the Rocky Mountains near Canmore, Alberta at ca. 24:00 hours on 17 August 1977. The animal was a full-developed adult measuring 240 mm in total length (Fig. 1). These salamanders constitute the highest elevation Tiger Salamander population (ca. 1,312 m asl) known in Canada. Since the altitudinal foreshortened active season for these amphibians lasts only a few months each year (mid-May to early September?) and Tiger Salamanders transform into adulthood in later summer at about 50-60 mm in total length (Smith 1961), it seems most unlikely that this animal could have developed so substantially had it transformed in 1977. Presumably, then, the salamander transformed into adulthood no later than May/June 1976.





Figure 1. Male *Ambystoma tigrinum* from Bow Valley Park, Alberta shortly after capture (October 1977). Numbered polygons indicate representatives sites of pigmentation change.

C. Wallis

This male Tiger Salamander has been maintained indoors at room temperature in a large, sand-bot-

tomized terrarium with a shallow pool at one end and a board for shelter at the other. It is fed irregularly with a

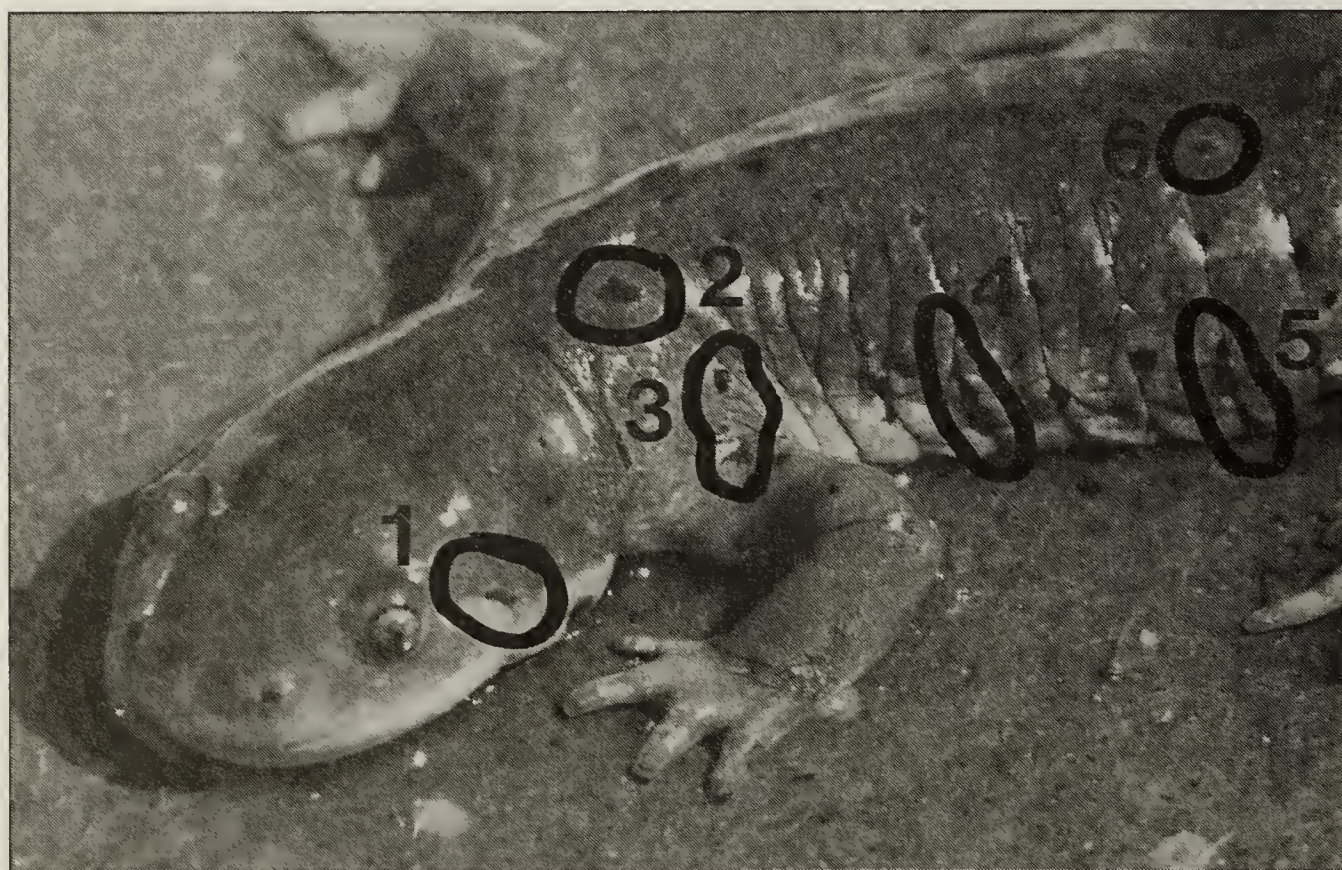


Figure 2. Male *Ambystoma tigrinum* (same animal as Fig. 1) ten years after capture (April 1987); note significantly reduced black markings on dorsum and sides and darker base colour of skin. Numbered polygons indicate representatives sites of pigmentation change.



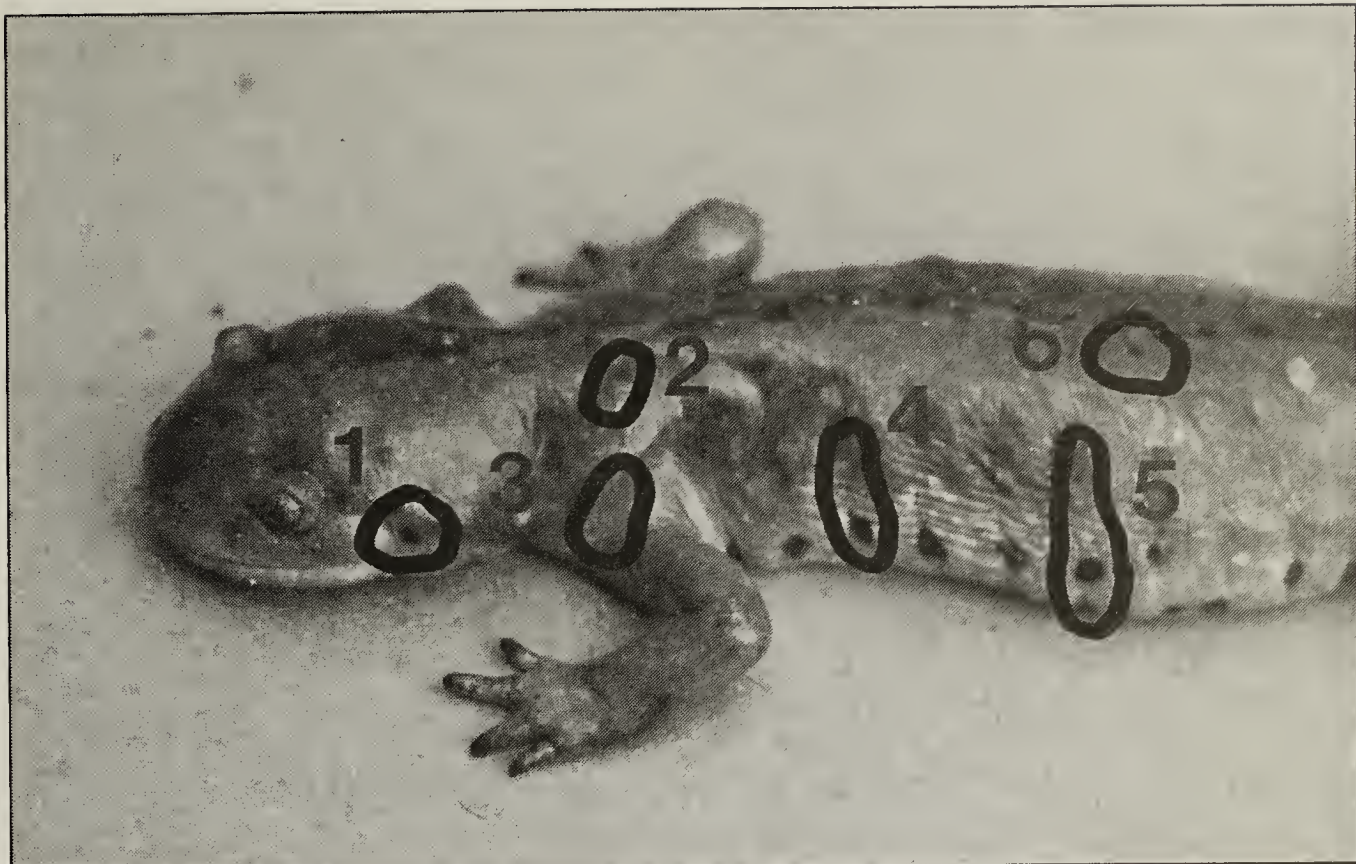


Figure 3. Male *Ambystoma tigrinum* (same animal as Fig. 1) 20 years after capture (October 1997); note continued but lessened rate of reduction in black markings on dorsum and sides. Numbered polygons indicate representatives sites of pigmentation change.

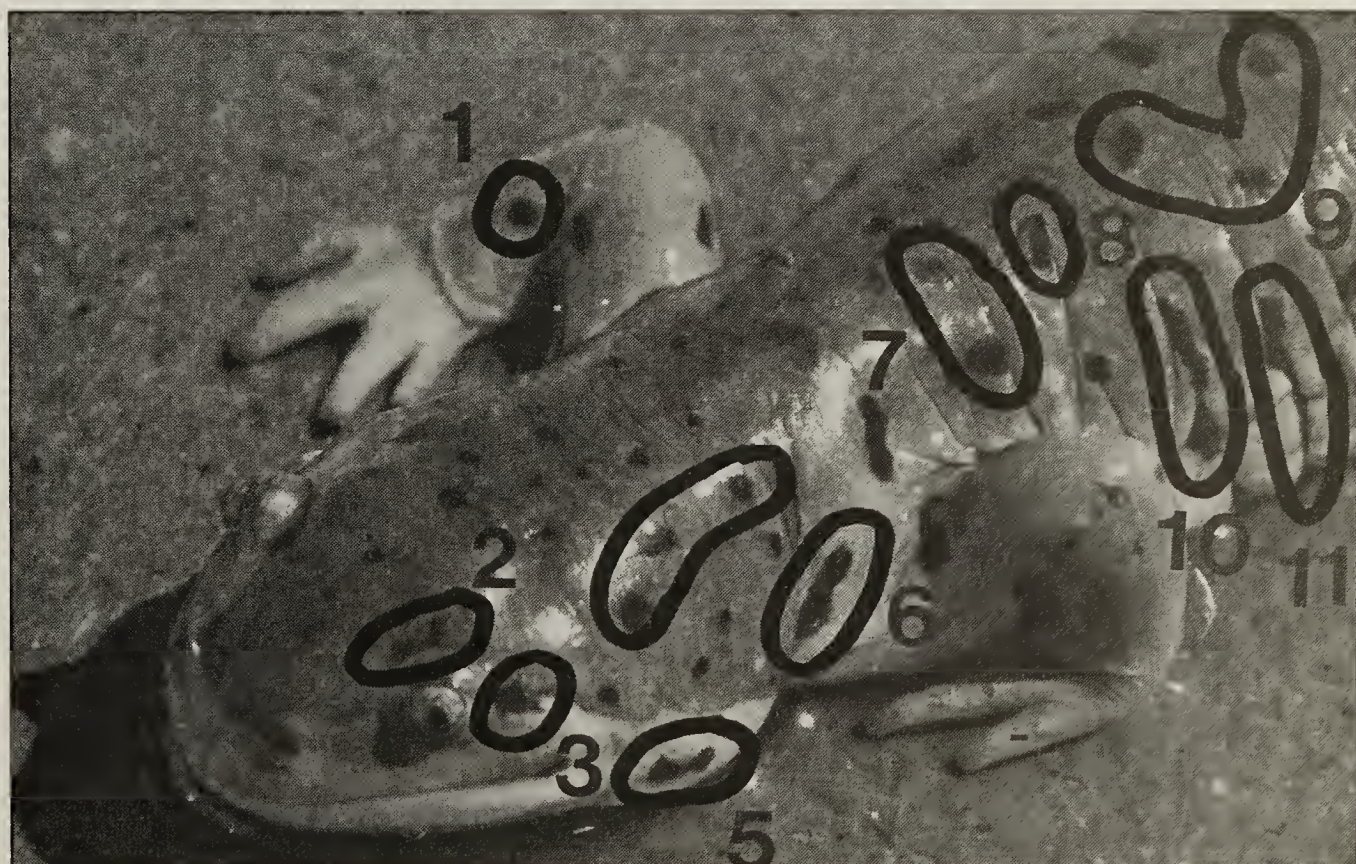


Figure 4. Adult female *Ambystoma tigrinum* after 3.5 years of captivity (April 1987); note reduced coverage of black markings on dorsum and sides and darker base colour of skin than recently captured male illustrated in Fig. 1. Numbered polygons indicate representatives sites of pigmentation change.





Figure 5. Adult female *Ambystoma tigrinum* (same animal as Fig. 1) after eight years of captivity (October 1991); note reduced coverage of black markings on dorsum and sides and darker base colour of skin. Numbered polygons indicate representative sites of pigmentation change.

variety of meat items including worms, table scraps and cat food. The animal has remained active year-round since 1977 and moves throughout its enclosure at all hours of the day and night. It has excavated and maintains a network of tunnels in the sand which it enters from beneath the log. It spends much of each day peering out from the tunnel entrance and emerges rapidly in response to the terrarium light being turned on and/or to nearby human activity. The salamander aggressively snaps at and seizes any moving object within the terrarium (fingers, a spoon, etc.) in pursuit of potential food items.

A second Tiger Salamander, a 230 mm (total length) adult female, was obtained from the Bow Valley Park population in October 1983 and until its death eight years later (1 October 1991), was kept with the older male. Interaction between the two was minimal except when the rapid

movements of one (e.g. when eating) would initiate aggressive snapping by the other.

The relative extent and pigmentation pattern of the female at the time of capture was very similar to that of the male in 1977 (Fig. 1; personal observation). Photographs of the salamanders were taken at intervals during their captivity (1977, 1983, 1986, 1987, 1989, 1990, 1991 and annually since 1994) in order to document pigmentation changes.

## Results

Fig. 2 illustrates the dramatic reduction in the size and number of black markings on the dorsum and sides of the male Tiger Salamander after 10 years of captivity (April 1987). The base colour of the skin of this animal also changed from a light yellowish olive to a dusky olive brown. The 1983 photographs (not reproduced due to poor quality) indicate that the majority of pigmentation



change occurred within the first six years. The decline in size and number of black markings between 1987 and 1997 is slight (Figs. 2 and 3).

The largest black markings remaining after ten years are located in the costal grooves of the male Tiger Salamander. Although reduction in the intensity, number and size of black spots has continued on the head and legs, it appears to have proceeded very slowly after the six to ten year point (Figs. 2 and 3).

Faded black marks along the sides of the female also are evident in a comparison of 1987 and 1991 photos (Figs. 4 and 5). Again, the majority of pigment change appears to have occurred in the first few years (2 to 3 years?) of captivity. By November 1986 the female exhibited significantly less dark pigmentation than is typical of mature, wild Blotched Tiger Salamanders (*A. tigrinum melanostictum* Baird), the westernmost Canadian subspecies to which the Bow Valley Park population belongs (personal observation; photographs not reproduced due to poor quality). The male (and the female to a lesser degree) more closely resemble the Gray Tiger Salamander (*A. tigrinum diaboli* Dunn), a relatively plainly marked subspecies which is found in central North America, extending northward into Manitoba and Saskatchewan (Gehlback 1967, Cook 1984).

Many factors beyond the passage of time could have a bearing on the pigmentation change of these Tiger Salamanders. Their year-round activity, their unnatural and irregular diet, their high frequency of diurnal, above-ground activity and the physical conditions of their confinement may have played a role individually or in combination. Regardless of the cause, it is evident that significant

pigmentation pattern changes do occur and do so in a relatively short period of time. Caution, therefore, must be exercised in subspecifically assigning individual Tiger Salamanders for which the life history is poorly known or is suspected to be abnormal.

The male salamander observed here apparently represents the oldest wild or captive Tiger Salamander known (21.5+ years). No references to animals more than about 15 years of age have been found. This longevity record is all the more remarkable when one considers that it is likely physically active for more than twice as long each year than wild members of its native population.

**Acknowledgements** Cliff Wallis of Calgary generously provided permission for the use of his 1977 photograph of the male animal from which Fig. 1 was produced. The female specimen was obtained with the assistance of Eric Kuhn of Bow Valley Provincial Park, Alberta. Francis Cook, former Curator of Herpetology, Canadian Museum of Nature, provided literature references, herpetological and other valuable assistance during this undertaking.

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## ON EXTINCTION

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Around 65 million years ago, or so the story goes, an extraterrestrial object hit our earth. That impact wrought havoc upon the animals and plants of that time, in particular wiping out the group then dominant on land — the dinosaurs. It is a colourful, dramatic concept. For many people — yes, even many scientists — it has become an article of faith, so firmly accepted as to be no longer questioned.

Yes, there are good reasons to believe that there was an extraterrestrial “event” at that time. Geophysical results have produced the image of a large crater at Chicxulub, in Mexico’s Yucatan Peninsula. This is considered to result from the impact of an asteroid, a large meteorite or, just possibly, a comet. Moreover, beneath the waters of the North Atlantic Ocean and widely elsewhere, the sediments at the Cretaceous-Tertiary boundary are unusually rich in iridium, an element that is normally quite rare. The iridium layer is so widespread that it is now being used to define the boundary between two geological eras, the Cretaceous and the Tertiary.

The question, though, is whether this impact did indeed trigger a worldwide extinction — of the dinosaurs and of the other creatures that were supposedly its victims. By Late Cretaceous times, the world was a populous place, with a rich vegetation in which the flowering plants were becoming predominant and

with a whole array of animals other than the dinosaurs. There were crocodiles in abundance, some living wholly on land; there were lizards and snakes in quantity; most of the modern groups of birds and insects were already present; and the mammals, which had for so long been tiny creatures living in the shadow of the dinosaurs, were becoming bigger and already, it seems, competing with them for food.

Well before that “boundary event,” there had already been significant changes. The pterodactyls, once the kings of the Mesozoic skies, had already succumbed to competition from the birds. Only a handful of big scavengers, typified by the jet-fighter-sized *Quetzalcoatlus*, were still surviving. In the seas the coil-shelled ammonites and the belemnites — creatures having a bullet-shaped internal “guard,” much like the cuttlefish bone that budgies chew — were in deep decline. The ammonites faded out well before the end of the Cretaceous, whereas a few belemnites actually lived on past the “event.” The plesiosaurs and mosasaurs, the marine reptiles which had fed on these two groups, were gone, their extinction hastened by increasing competition from the sharks. In contrast, the marine turtles, protected by their shells, swam on happily through the “event” and onward to the present day. The fishes, whether living in the seas or

in rivers and lakes, were equally unaffected. So too was a primitive crocodile-like group called the champsosaurs, which might have seemed fit candidates for oblivion.

Yes, some species and even genera from the groups listed above did become extinct at about that time. However, these extinctions were minor, occurring at a rate readily accounted for by the competition and the changing relations of land and seas — in other words, at a quite normal rate. Neither were there major extinctions among the land plants nor the marine plankton. Yes, one small group of zooplankton did fade out, but the other groups showed no signs of decimation.

So, when considering this supposed “mass extinction” at the time of the presumed impact, we are left with the dinosaurs. Well, what about them? Weren’t they a flourishing group and didn’t they suffer a worldwide simultaneous wiping-out?

The answer to those questions is “No” and “We don’t know.” The dinosaurs, after being abundant and diverse for 125 million years, had begun to decline in variety about fifteen million years earlier — a long time earlier, longer than the entire span of man’s life on earth. By the end of Cretaceous times only a few types were left, notably the ceratopsians (the horned herbivores) and the carnosaurs (the bipedal predators that preyed on them). Most other types of dinosaurs may have already faded out.

I write “may” because, in honest, we *do not know* when the dinosaurs became extinct. We have evidence only from a very circumscribed region — the northern Great Plains of the United States and Canada. From other parts of the world, there is as yet no information.

To confidently assume that, because an extinction happened in that time in one region, it happened worldwide at the same time, is manifestly absurd. At that same time, the marsupials (the pouched mammals) disappeared from the North American fossil record, yet they remain numerous in South America and Australasia, right through to the present day. One of them, the opossum, has even spread back to Canada!

Moreover, certain dinosaurs would surely have been well suited to life in tropical jungles. That is an environment so inimical to the processes of fossilization that we know almost nothing of what lived in it, before, during or after the time of the dinosaurs. Is it coincidence that, when reports have come of living dinosaurs, it has always been from tropical jungles?

What other evidence is there for a “mass extinction” at about the time of that supposed extraterrestrial impact? Well, there is indication from fossil plants that certain plant communities were destroyed — and guess where? Yes, you have it — in the northern Great Plains. Farther north in Canada and in other regions of the world, nothing similar seems to have happened. Moreover, even in that region the plant communities recovered fully in less than ten thousand years — in geological terms, a very swift recovery and scarcely suggesting a planet-wide devastation!

Study of the sediments beneath the North Atlantic Ocean has also revealed a hiatus, a time when the sediments were barren of microfossils. Again, though it was a brief interval, the micro-organisms were soon back. If devastation had been worldwide, where did they come from so swiftly?



Well then, let's put it all together. Yes, there are convincing indications that, 65 million years ago, the earth may have suffered the impact of some extraterrestrial body. The iridium layer, found so widely across the globe, may have been a product of that impact (though some geochemists believe it had a volcanic origin). However, that layer is nowhere found resting upon a concentration of fossils of *any kind*, let alone dinosaur bones!

Indeed, the evidence from fossils does not indicate a worldwide biological cataclysm. There was no

"mass extinction"; most groups of organisms survived from the Cretaceous to Tertiary, quite unaffected. The dinosaurs, already in decline, may have been wiped out in North America by the short-term environmental effects of that impact. Elsewhere in the world, though, we cannot say when they became extinct, for we have no evidence.

Editor's Note: This article was originally printed in the *Ottawa Citizen*.



*Loggerhead Shrike*

S. McAdam



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# OBITUARY

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## Raymond Belanger

R.J. "Dick" Gutfriend, President, Weyburn Nature Society

Weyburn and area birders were saddened to hear of the sudden death of one of the most avid birders and conservationists in our area, if in the whole of Saskatchewan.

Ray was born in Estevan on 15 April 1940, took his early schooling in Lampman, then attended Campanion College in Regina for Grades 11 and 12. Upon graduation, he moved to Weyburn to work at the Saskatchewan Hospital, graduating as a Psychiatric Nurse in 1961. In 1962 he transferred to the Ward Activities Department, in 1970 Ray was appointed Supervisor of the Recreation Department, in 1973 he was promoted to the position of Coordinator of Therapies, a position he held until retirement in July of 1993, after working in the same facility for 35 years.

Ray was very dedicated to his work — his goal was to make life better and happier for the patients of Saskatchewan Hospital. The many hours Ray spent to get to know the wants and needs of the patients were much appreciated by both the patients and staff as the lives of those he touched and influenced were improved, enlightened and full of enjoyment. Ray always had time to stop and talk — giving a patient his last cigarette or money for a cup of coffee or a coke.

Ray loved all sports and enjoyed playing or watching curling, football, hockey, boxing, hunting, fishing and of course baseball, the love of this life. Ray was a Major League Base-

ball scout, first for the Cincinnati Reds and then Canadian Scouting Director for the Atlanta Braves. In 1988 Ray was elected to the Saskatchewan Baseball Hall of Fame.

Ray was an avid birder, he was always on the lookout for that rare and elusive bird. Many a time he would phone and say something like this — "a flock of whooping cranes have been spotted west of McTaggart, let's go and see if we can find them" and away we went.

In 1984 Ray spearheaded a group of interested birders to form the Weyburn Natural History Society and in January 1985, the Society received its Charter. Ray was the first President in 1985 and again in 1986, 1994 and 1995. Ray was also a director for the Saskatchewan Natural History Society. In 1987, Ray and a group of avid Weyburn birders spotted a Band-tailed Pigeon on the Hospital grounds, a report of which appeared in the Saskatchewan Natural History Society's magazine *Blue Jay*.

Ray was always concerned about the environment and what we, as humans, are doing to destroy the habitat of the flora and fauna of our beloved area, province and country. Ray's expertise at writing was used on many occasions to express his and our concerns about what a group or company is doing to destroy our beautiful area.

Ray was continually on the lookout for new projects for himself and



the Weyburn Nature Society. Some of his achievements were: being the first participant in the Weyburn area "Project Feeder Watch," contacting Veterinarians in Weyburn to look after injured birds, helping with the amphibian survey, helping with a provincial owl count, getting the Society involved in the adopt-a-highway program. He was instrumental in building the Souris Valley Nature Trail, starting the Weyburn Public Schools in an annual birdathon for Grade 3's and working to set up a scholarship for Grade 12 graduates. He wrote the "Nature Watch" article for the *Weyburn Review* for many years.

Ray was always busy but never too busy to talk about birding or to tell a good joke. Ray, on many occasions, spoke to school children or adult groups about birding and the environment. In the early 1990s, Ray undertook to do a three-year study of "Shorebirds at the city of Weyburn Sewage Lagoon Cells." A copy of that report was published in an edition of the *Blue Jay* magazine. Ray

had just completed a book for the City of Weyburn Parks Board entitled "Flora and Fauna of Tatagwa Parkway," which is at the printers at the present time.

Ray was a dedicated individual and always had time to visit and help the people he came in contact with. His love of life and people was shown by the many friends that came to pay last respects on 13 November 1997. Ray will be deeply missed by the many patients he cared so much for, the staff he worked with and helped in their times of need, the many young ball players he coached and guided through their growing years, and the many friends he had on coffee row, at the Elks and the many buddies he had in all walks of life. Ray leaves to mourn, his wife Louise, daughter Cindy (Tim) Herberhiltz, sons Neil and Mark, grandchildren Danielle and Mitchell, along with many relatives and friends.

Ray will be deeply missed by all who knew him.



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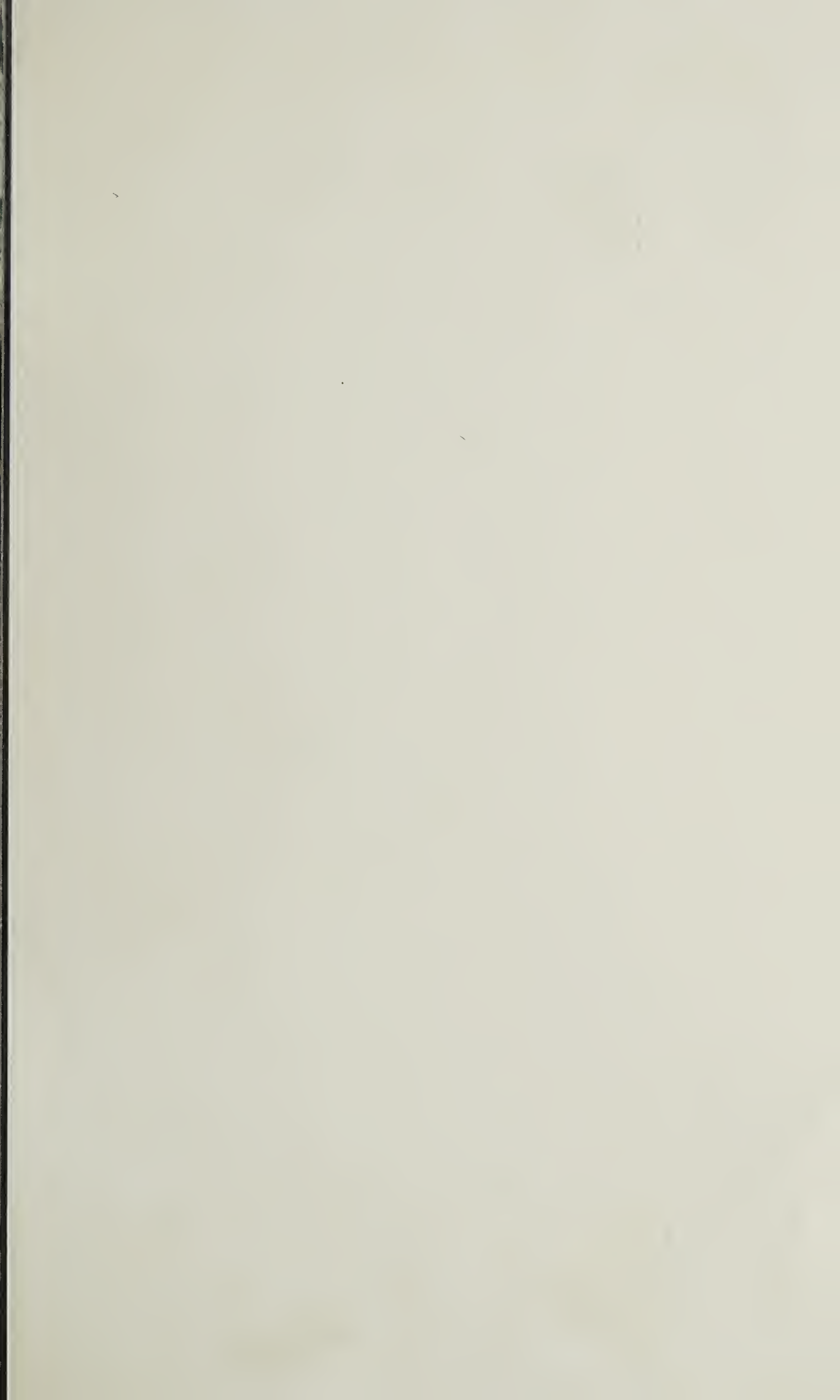
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